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PART II
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Title 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

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AUTHORITY: The provisions of this Part 90 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4426, as amended, 4427, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 404, 405, 366, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659, unless otherwise noted.

Subpart 90.01—Authority and Purpose

§ 90.01–1 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for cargo and miscellaneous vessels, as listed in Column 5 of Table 90.05–1(a), in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various International Conventions for Safety of Life at Sea and other treaties which affect the merchant marine. The regulations are necessary to carry out the provisions of law affecting cargo and miscellaneous vessels and such regulations have the force of law.

§ 90.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950 (15 F. R. 4935, 3 CFR, 1950 Supp., p. 178, 5 U. S. C. note under 241), effective July 31, 1950, the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury, with certain specified exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 90.01–10 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally is set forth in 46 U.S. Code, sections 375 and 416, as well as in certain other provisions in 46 U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 381, 391, 391a, 392, 393, 399, 400, 402–414, 435, 436, 451–453, 460, 461, 462, 464, 467, 470–482, and 489–498, and acts amendatory thereof or supplemental thereto. Under the provisions of 46 U.S. Code, section 372, the Commandant, United States Coast Guard, superintends the administration of vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations.

(b) *Inspection and certification.* (1) The regulations regarding inspection and certification of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 361, 362, 363, 366, 367, 391, 392, 395, 404, 405, 411, 435, and 481, and 50 U.S. Code, section 198.

(c) *Construction and arrangement.* (1) The regulations regarding the construction and arrangement of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 404, 481, and 482, and 50 U.S. Code, section 198.

(d) *Stability.* (1) The regulations regarding stability of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 85a, 88a, 363, 367, 391, 392, 404, 481, 482, and 483, and 50 U.S. Code, section 198.

(e) *Lifesaving equipment.* (1) The regulations regarding lifesaving equipment of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 404, 481, and 526p, and 50 U.S. Code, section 198.

(f) *Fire protection equipment.* (1) The regulations regarding fire protection equipment of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 395, 404, 481, and 526p, and 50 U.S. Code, section 198.

(g) *Vessel control and miscellaneous systems and equipment.* (1) The regulations regarding vessel control and miscellaneous systems and equipment of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 395, 391, 392, 404, and 435, and 50 U.S. Code, section 198.

(h) *Operations.* (1) The regulations regarding operations of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 395, 404, and 435, and 50 U.S. Code, section 198.

(i) *Special construction, arrangement, and provisions for certain dangerous cargoes in bulk.* (1) The regulations regarding special construction, arrangement, and provisions for certain dangerous cargoes in bulk of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, section 170, and 50 U.S. Code, section 198.

Subpart 90.05—Application

§ 90.05–1 Vessels subject to requirements of this subchapter.

(a) This subchapter shall be applicable to all United States flag vessels indicated in Column 5 of Table 90.05–1(a) and to all such foreign vessels which carry 12 or less passengers from any port in the United States to the extent prescribed by law, except as follows:

(1) Any vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, and which has on board a current, valid safety equipment certificate.

(2) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(3) Any vessel while laid up and dismantled and out of commission.

(4) With the exception of vessels of the U. S. Maritime Administration, any vessel with title vested in the United States and which is used for public purposes.

(b) Notwithstanding the exception previously noted in subparagraph (a)(1) of this section, foreign vessels of novel design or construction or whose operation involves potential unusual risks shall be subject to inspection to the extent necessary to safeguard life and property in United States ports, as further provided by § 2.01–13 of Subchapter A (Procedures Applicable to the Public) of this chapter.

TABLE 90.05-1(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2] [3] [4] or Subchapter T—Small Passenger Vessels [2] [4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2] [4]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2] [4]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

(R.S. 4472, as amended; 46 U.S.C. 170)

§ 90.05–5 Specific application noted in text.

(a) At the beginning of the various parts, subparts, and sections, a more specific application is generally given for the particular portion of the text involved. This application sets forth the types, sizes, or services or vessels to which the text pertains, and in many cases limits the application of the text to vessels contracted for before or after a specific date. As used in this subchapter, the term "vessels contracted for" includes not only the contracting for the construction of a vessel, but also the contracting for a material alteration to a vessel, the contracting for the conversion of a vessel to a cargo or miscellaneous vessel, and the changing of service or route of a vessel if such change increases or modifies the general requirements for the vessel or increases the hazards to which it might be subjected.

§ 90.05–7 Ocean or unlimited coastwise vessels on inland and Great Lakes Routes.

(a) Vessels inspected and certificated for ocean or unlimited coastwise routes shall be considered suitable for navigation insofar as the provisions of this subchapter are concerned on any inland routes, including the Great Lakes.

§ 90.05–10 Application to vessels on an international voyage.

(a) Where, in various places or portions of this subchapter, requirements are stipulated specifically for "vessels on an international voyage," it is intended that these requirements apply only to vessels subject to the International Convention for Safety of Life at Sea, 1960, which are mechanically propelled vessels of 500 gross tons and over on an international voyage, as defined in § 90.10–17, other than yachts and fishing vessels.

(b) In accordance with Regulation 4, Chapter I (General Provisions) of the International Convention for Safety of Life at Sea, 1960, a vessel which is not normally engaged on an international voyage, but which in exceptional circumstances, is required to undertake a single international voyage may be exempted by the Commandant from any of the requirements of the Regulations of the Convention: *Provided,* That it complies with safety requirements which are adequate, in his opinion, for the voyage which is to be undertaken.

(c) In accordance with Regulation 1(c), Chapter II (Construction) of the International Convention for Safety of Life at Sea, 1960, the Commandant may, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of Chapter II of this Convention unreasonable or unnecessary; exempt from those requirements individual vessels or classes of vessels which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

(d) In accordance with Regulation 3 (a), Chapter III (Lifesaving Appliances, Etc.) of the International Convention for Safety of Life at Sea, 1960, the Commandant, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of the full requirements of Chapter III of this Convention unreasonable or unnecessary, may to that extent exempt from the requirements of Chapter III individual vessels or classes of vessels which, in the course of their voyage, do not go more than 20 miles from the nearest land.

§ 90.05–25 Seagoing barge.

(a) All nonself-propelled vessels of 100 gross tons and over that proceed on voyages on the high seas or ocean are subject to inspection and certification as seagoing barges.

(b) In applying the laws and regulations to manned seagoing barges, one criterion for invocation of safety standards is the description of seagoing barges by relative size in gross tons. When it is determined by the Commandant that the gross register tonnage for a particular manned seagoing barge, which is attained by exemptions, reductions, or other devices in the basic gross tonnage formulation, will circumvent or be incompatible with the application of specific safety requirements in the regulations in this subchapter for a manned seagoing barge of such physical size, the Commandant shall prescribe the regulations to be made applicable to such seagoing barge. When the Commandant determines that the gross register tonnage is not a valid criterion for the invocation of safety requirements based on relative size, the parties involved will be informed of the determination and of the regulations applicable to such manned seagoing barges, and before being permitted to operate such seagoing barges, compliance therewith shall be required. Endorsements or notations on the seagoing barge's certificate of inspection may be made as appropriate.

§ 90.05–30 Portable containers—interpretive rulings.

(a) The phrase "drums, barrels, or other packages," as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to mean portable containers having a maximum capacity of 110 U.S. gallons and ICC specification cylinders having a water capacity of not more than 1,000 pounds, which are actually loaded and discharged from vessels with their contents intact.

(b) The phrase "inflammable or combustible liquid cargo in bulk" as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to include such cargo in portable containers of a capacity of more than 110 U.S. gallons.

(c) The phrase "liquid cargo" as used in R.S. 4417a, as amended (46 U.S.C. 391a), is interpreted to mean inflammable or combustible liquids.

(Interpret or apply R.S. 4417a, as amended, 4472, as amended; 46 U.S.C. 391a, 170)

Subpart 90.10—Definition of Terms Used in This Subchapter

§ 90.10–1 Approved.

This term means approved by the Commandant unless otherwise stated.

§ 90.10–2 Barge.

This term means any nonself-propelled vessel.

§ 90.10–3 Carrying passengers for hire.

The carriage of any person or persons by a vessel for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent or any other person interested in the vessel.

§ 90.10–5 Carrying freight for hire.

The carriage of any goods, wares, or merchandise or any other freight for a valuable consideration whether directly or indirectly flowing to the owner, charterer, operator, agent, or any other person interested in the vessel.

§ 90.10–7 Commandant.

This term means the Commandant of the Coast Guard.

§ 90.10–9 Coast Guard District Commander.

This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 90.10–11 Coastwise.

Under this designation shall be included all vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

§ 90.10–12 Gas free.

This term means free from dangerous concentrations of flammable or toxic gases.

(Interpret or apply R.S. 4417a, as amended, 4472, as amended; 46 U.S.C. 391a, 170)

§ 90.10–13 Great Lakes.

Under this designation shall be included all vessels navigating the Great Lakes.

§ 90.10–15 Headquarters.

This term means the Office of the Commandant, United States Coast Guard, Washington, D.C., 20226.

§ 90.10–17 International voyage.

(a) The term "international voyage" as used in this subchapter shall have the same meaning as that contained in Regulation 2(d), Chapter I of the International Convention for Safety of Life at Sea, 1960, i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the

international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purposes of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) In addition, although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purposes of this subchapter.

§ 90.10–19 Lakes, bays, and sounds.

Under this designation shall be included all vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

§ 90.10–21 Marine inspector or inspector.

These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 90.10–23 Motorboat.

This term means any vessel indicated in Column 5 of Table 90.05–1(a) 65 feet in length or less which is propelled by machinery (including steam). The length shall be measured from end to end over the deck excluding sheer. This term includes a boat temporarily or permanently equipped with a detachable motor and any such boat when so propelled is subject to the applicable provisions of the Act of April 25, 1940, as amended (secs. 1–22, 54 Stat. 163–167, as amended, 46 U.S.C. 526–526u), and the regulations promulgated thereunder. For the purpose of this subchapter, motorboats are included under the term "vessel" unless specifically noted otherwise. The various classes of motorboats are as follows:

Class A—Any motorboat less than 16 feet in length.
Class 1—Any motorboat 16 feet or over and less than 26 feet in length.
Class 2—Any motorboat 26 feet or over and less than 40 feet in length.
Class 3—Any motorboat 40 feet or over and not more than 65 feet in length.

§ 90.10–24 Nuclear vessel.

(a) A nuclear vessel is a vessel provided with a nuclear powerplant for propulsion or any other purpose, or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

§ 90.10–25 Ocean.

Under this designation shall be included all vessels navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

§ 90.10–27 Officer in charge, marine inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 90.10–29 Passenger.

A passenger is every person other than the master and the members of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel. In the case of a vessel on an international voyage a child under 1 year of age is not counted as a passenger.

§ 90.10–31 Rules of the Road.

(a) The term "Rules of the Road" means the statutory and regulatory rules governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 90.10–33 Rivers.

Under this designation shall be included all vessels whose naivgation is restricted to rivers and/or canals exclusively, and to such other waters as may be so designated by the Coast Guard District Commander.

§ 90.10–35 Recognized classification society.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

§ 90.10–36 Seagoing barge.

The phrase "every seagoing barge of one hundred gross tons or over" in subsections 395(a) and 395(b), Title 46, U.S. Code (sec. 10, 35 Stat. 428, as amended), includes every nonself-propelled vessel of 100 gross tons or over, if such vessel will navigate the high seas or ocean. The phrase "nonself-propelled vessel" means a vessel without sufficient means for self-propulsion and is required to be towed.

§ 90.10–37 Vessel.

Where the word "vessel" is used in this subchapter, it shall be considered to include all vessels indicated in Column 5 of Table 90.05–1(a), except as otherwise noted in this subpart.

§ 90.10–39 Western rivers.

For the purpose of this subchapter, the term "western rivers" is as defined in CG–184, "Rules of the Road—Western Rivers."

Subpart 90.15—Equivalents

§ 90.15–1 Conditions under which equivalents may be used.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such conditions as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

Subpart 90.20—General Marine Engineering Requirements

§ 90.20–1 Marine engineering details.

(a) All marine engineering details such as piping, valves, fittings, boilers, pressure vessels, etc., and their appurtenances installed on the vessel, shall be designed, constructed, and installed in accordance with the provisions of Subchapter F (Marine Engineering) of this chapter.

(R.S. 4418, as amended, 4433, as amended; 46 U.S.C. 392, 411)

§ 90.20–5 Nuclear vessels.

(a) Nuclear vessels shall comply with the applicable requirements in Subpart 57.30 of Part 57 of Subchapter F (Marine Engineering) of this chapter. The reg-

ulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(Sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 2, 14 U.S.C. 2, 633. Interpret or apply R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4472, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 391, 391a, 392, 170, 1333, 390b. Treasury Department Order 167-17, June 29, 1955, 20 F.R. 4976)

Subpart 90.25—General Electrical Engineering Requirements

§ 90.25-1 Electrical engineering details.

(a) All electrical engineering details and installations shall be designed and installed in accordance with Subchapter J (Electrical Engineering) of this chapter.

(R.S. 4418, as amended; 46 U.S.C. 392)

Subpart 90.30—Special Provisions

§ 90.30-1 Vessels acquired or documented under the act of August 9, 1954.

(a) Vessels acquired or documented under the Act of August 9, 1954 (sec. 3, 68 Stat. 675; 50 U.S.C. 198), shall be subject to the applicable provisions of Title 52 of the Revised Statutes, acts amendatory thereof or supplemental thereto and the rules and regulations thereunder.

(b) Unapproved lifesaving, firefighting, and other equipment may be continued in service as long as, in the opinion of the Officer in Charge, Marine Inspection, such equipment is in good and serviceable condition. All replacements shall be in accordance with Coast Guard requirements.

§ 90.30-5 Installations of equipment made during the unlimited national emergency declared by the President on May 27, 1941.

(a) Boilers, pressure vessels, machinery, piping, electrical, and other installations, including lifesaving, firefighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec. 501, 56 Stat. 180, 50 U.S.C. App. 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

Subpart 90.35—American Bureau of Shipping's Standards

AUTHORITY: The provisions of this Subpart 90.35 interpret or apply sec. 25, 41 Stat. 998, as amended; 46 U.S.C. 881.

§ 90.35-1 Standards to be used.

(a) Where in this subchapter an item, or method of construction, or testing is required to meet the standards established by the American Bureau of Shipping, the current standards in effect at the time of construction of the vessel, or otherwise as applicable, shall be used. The current standards of other recognized classification societies may also be accepted upon approval by the Commandant.

§ 90.35-5 Where obtainable.

(a) The standards established by the American Bureau of Shipping are usually published annually and may be purchased from the American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004. These standards may be also examined at the Office of the Commandant (M), U.S. Coast Guard, Washington, D.C., 20226, or at the Office of any Coast Guard District Commander or Officer in Charge, Marine Inspection.

PART 91—INSPECTION AND CERTIFICATION

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AUTHORITY: The provisions of Part 91 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4418, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 392, 404, 405, 411, 435, 481, 366, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 91.01—Certificate of Inspection

AUTHORITY: The provisions of this Subpart 91.01 interpret or apply R.S. 4421, as amended, 4423, as amended, sec. 12, 35 Stat. 428, as amended; 46 U.S.C. 399, 400, 397.

§ 91.01–1 When required.

(a) Except as noted in this subpart or Subpart 91.05, no vessel subject to inspection and certification shall be operated without a valid certificate of inspection.

§ 91.01–5 Posting.

(a) On vessels of over 25 gross tons, the original certificate of inspection shall, in general, be framed under glass and posted in a conspicuous place where it will be most likely to be observed. On vessels not over 25 gross tons, and on other vessels such as barges, where the framing of the certificate under glass would be impracticable, the original certificate of inspection shall be kept on board to be shown on demand.

§ 91.01–10 Period of validity.

(a) Certificates of inspection will be issued for periods of either 1 or 2 years. Application may be made by the master, owner, or agent for inspection and issuance of a new certificate of inspection at any time during the period of validity of the current certificate. For nuclear vessels, the period of validity shall be 1 year.

(b) Certificates of inspection may be revoked or suspended by the Coast Guard where such process is authorized by law. This may occur if the vessel does not meet the requirements of law or regulations in this chapter or if there is a failure to maintain the safety requirements requisite to the issuance of a certificate of inspection.

(c)(1) In the case of the following vessels, modification of the period of validity of the certificate of inspection will be permitted as set forth in this paragraph:

(i) Nonself-propelled vessels of 100 gross tons and over proceeding on the high seas or ocean for the sole purpose of changing place of employment.

(ii) Nonself-propelled vessels of 100 gross tons and over making rare or infrequent voyages on the high seas or ocean and returning to the port of departure.

(2) The certificate of inspection may be issued for a specific period of time to cover a described situation or for one voyage only but in no case to exceed 2 years. The certificate of inspection will include the conditions under which the vessel must operate. Unless the vessel is in compliance with this Subchapter insofar as it applies to seagoing barges of 100 gross tons and over, such vessel shall not carry any person on board while underway, and the certificate of inspection will be endorsed as an unmanned seagoing barge.

§ 91.01–15 Temporary certificate.

(a) If necessary to prevent delay of the vessel, a temporary certificate of inspection, Form CG–854, shall be issued pending the issuance and delivery of the regular certificate of inspection. Such temporary certificate shall be carried in the same manner as the regular certificate and shall in all ways be considered the same as the regular certificate of inspection which it represents.

§ 91.01–20 Expired certificate.

(a) Nothing in this subpart shall prevent a vessel upon a regularly established line from a port in the United States to a port of a foreign country not contiguous to the United States whose certificate of inspection expires at sea or while said vessel is in a foreign port or a port of Hawaii from lawfully completing her voyage without the valid certificate of inspection or temporary certificate required by this subpart: *Provided,* That the certificate of inspection did not expire within 15 days after the vessel left the last port of the United States, and that the voyage shall be completed within 30 days after the expiration of the certificate of inspection.

Subpart 91.05—Permit To Proceed to Another Port for Repair

§ 91.05–1 When issued.

(a) The Officer in Charge, Marine Inspection, may issue a permit to proceed to another port for repair, Form CG–948 to a vessel, if in his judgment it can be done with safety, even if the certificate of inspection of the vessel has expired or is about to expire.

§ 91.05–5 To whom issued.

(a) Such permit will only be issued upon the written application of the master, owner, or agent of the vessel.

§ 91.05–10 Conditions of permit.

(a) The permit will state upon its face the conditions under which it is issued and whether or not the vessel is permitted to carry freight or passengers.

§ 91.05–15 Posting.

(a) The permit shall be carried in a manner similar to that described in § 91.01–5 for a certificate of inspection.

Subpart 91.15—Inspection of Vessels

§ 91.15–1 Standard in inspection of hulls, boilers, and machinery.

(a) In the inspection of hulls, boilers, and machinery of vessels, the standards established by the American Bureau of Shipping, see Subpart 90.35 of this subchapter, respecting material and construction of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), Subchapter F (Marine Engineering), or Subchapter J (Electrical Engineering) of this chapter shall be accepted as standard by the inspectors.

Subpart 91.20—Initial Inspection

§ 91.20–1 Prerequisite of certificate of inspection.

(a) The initial inspection is a prerequisite of the issuance of the original certificate of inspection.

§ 91.20–5 When made.

(a) The original inspection will only be made upon the written application of the owner or builder of the vessel to the Officer in Charge, Marine Inspection, on Form CG–3752, Application for Inspection of U.S. Vessel, at or nearest the port where the vessel is located.

§ 91.20–10 Plans.

(a) Before application for inspection is made, and before construction is started, the owner or builder shall have plans approved by the Commandant indicating the proposed arrangement and construction of the vessel. The procedure for submitting plans and the list of plans to be supplied is set forth in Subpart 91.55.

§ 91.20–15 Scope of inspection.

(a) The initial inspection, which may consist of a series of inspections during the construction of a vessel, shall include a complete inspection of the structure, machinery, and equipment, including the outside of the vessel's bottom, and the inside and outside of the boilers. The inspection shall be such as to insure that the arrangements, materials, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment fully comply with the applicable regulations for such vessel and are in accordance with approved plans, and that the radio installations, including fixed and portable radios for lifeboats, are in accordance with the requirements of the Federal Communications Commission. The inspection shall also be such as to insure that the workmanship of all parts of the vessel and its equipment is in all respects satisfactory, and that the vessel is provided with lights, means of making sound signals and distress signals as required by applicable regulations and the applicable "Rules of the Road."

(b) When equipment is installed which is not required by applicable regulations in this subchapter, that equipment shall be inspected and tested as required for such equipment by applicable regulations in Subchapter H (Passenger Vessels) of this chapter. For example, fire-detecting systems shall be inspected and tested as required by Subpart 71.20 of Subchapter H (Passenger Vessels) of this chapter.

(c) For nuclear vessels, the inspections required by this section shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

§ 91.20–20 Specific tests and inspections.

(a) The applicable tests and inspections as set forth in Subpart 91.25 of this part shall be made at this time. In addition, the following specific tests and inspections shall be made by the inspector.

(1) Installation of lifeboats, davits, and winches—see Subpart 94.35 of this subchapter.

(2) Installation of carbon dioxide extinguishing piping—see § 95.15–15 of this subchapter.

(3) For inspection procedures of marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

(4) For inspection procedures of Electrical Engineering equipment and systems, see Subchapter J (Electrical Engineering) of this chapter.

(5) For inspection and tests of tanks containing certain dangerous cargoes in bulk, see Part 98 of this subchapter.

Subpart 91.25—Inspection for Certification

§ 91.25–1 Prerequisite of reissuance of certificate of inspection.

(a) An inspection for certification is a prerequisite of the reissuance of a certificate of inspection.

§ 91.25–5 When made.

(a) The inspection for certification will be made only upon written application of the master, owner, or agent of the vessel on Form CG–3752, Application for Inspection of U.S. Vessel, to the Officer in Charge, Marine Inspection, at or nearest the port where the vessel is located.

§ 91.25–10 Scope of inspection.

(a) The inspection for certification shall include an inspection of the structure, boilers, and other pressure vessels, machinery, and equipment. The inspection shall be such as to insure that the vessel, as regards the structure, boilers and other pressure vessels, and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment, is in satisfactory condition and fit for the service for which it is intended, and that it complies with the applicable regulations for such vessel, and that the radio installation is in compliance with the requirements of the Federal Communications Commission. The lights and means of making sound signals and the distress signals carried by the vessels shall also be subject to the above mentioned annual inspection for the purpose of insuring that they comply with the requirements of the applicable regulations and the applicable Rules of the Road.

(b) For nuclear vessels, the inspections required by this section shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

(c) When equipment is installed which is not required by applicable regulations in this subchapter, that equipment shall be inspected and tested as required for such equipment by applicable regulations in Subchapter H (Passenger Vessels) of this chapter. For example, fire-detecting systems shall be inspected and tested as required by Subpart 71.25 of Subchapter H (Passenger Vessels) of this chapter.

§ 91.25–15 Lifesaving equipment.

(a) At each inspection for certification, except as modified in subparagraph (2) of this paragraph, the marine inspector shall conduct the following tests and inspections of lifesaving equipment:

(1) It shall be demonstrated that the air tanks of all lifesaving appliances are airtight.

(2) Each lifeboat shall be lowered to near the water and then be loaded with its allowed capacity, evenly distributed throughout the length, and then be lowered into the water until it is afloat, and be released from the falls. In making this test persons or deadweight may be used. The total weight used shall be at least equal to the allowed capacity of the lifeboat considering persons to weigh 165 pounds each. This test shall be made at least once in each two-year period. If practicable it shall be made at the inspection for certification or at a reinspection.

(3) Each life preserver shall be examined to determine its serviceability. If found to be satisfactory, it will be stamped "Passed," together with the date, the port, and the inspector's initials. If not in a serviceable condition, the life preserver shall be removed from the vessel's equipment, and if beyond repair, shall be destroyed in the presence of the inspector.

(4) All lifeboat winch electrical control apparatus shall be opened up and inspected.

(5) Where gravity davits are installed, it shall be demonstrated that the lifeboat can be swung out and lowered from any stopped position by merely releasing the brake on the lifeboat winch. The use of force to start the davits or the lifeboat winch will not be permitted.

(6) Inflatable liferafts shall be serviced at an approved servicing facility in accordance with the provisions of Subpart 160.051 of Subchapter Q (Specifications) of this chapter. Inflatable liferafts shall be serviced at an approved servicing facility every 12 months or not later than the next vessel inspection for certification provided the total time since date of last servicing does not exceed 15 months. The period for servicing is computed from the date of last servicing. Except in emergencies no servicing should be done aboard vessels. If at any time external damage is found to the container or straps or if the seal is broken, the Officer in Charge, Marine Inspection, shall be notified and the raft shall be serviced by an approved servicing facility.

NOTE: After the raft has been satisfactorily serviced in the presence of a marine inspector at an approved servicing facility, the raft is repacked and sealed and the carrying case stamped "PASSED" together with the date, port, and the marine inspector's initials.

(7) All other items of lifesaving equipment shall be examined to determine that they are in suitable condition.

§ 91.25–20 Fire-extinguishing equipment.

(a) At each inspection for certification and at such other times as considered necessary the inspector shall determine that all fire-extinguishing equipment is in suitable condition and may require such tests as are considered necessary to determine the condition of the equipment. The inspector shall determine if the tests and inspections required by § 97.15–60 of this subchapter have been conducted. At each inspection for certification the inspector shall conduct the following tests and inspections of fire-extinguishing equipment:

(1) All hand portable fire extinguishers and semi-portable fire extinguishing systems shall be checked as noted in Table 91.25–20 (a) (1). In addition, the hand portable fire extinguishers and semi-portable fire extinguishing systems shall be examined for excessive corrosion and general condition.

TABLE 91.25–20(a)(1)

Type unit	Test
Soda acid	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Foam	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Pump tank (water or antifreeze).	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge with clean water or antifreeze.
Cartridge operated (water, antifreeze or loaded stream).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Remove liquid. Clean hose and inside of extinguisher thoroughly. Recharge with clean water, solution, or antifreeze. Insert charged cartridge.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge. Inspect hose and nozzle to be sure they are clear.[1]
Dry chemical (cartridge-operated type).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Inspect hose and nozzle to see they are clear. Insert charged cartridge. Be sure dry chemical is free-flowing (not caked) and chamber contains full charge.
Dry chemical (stored pressure type).	See that pressure gage is in operating range. If not, or if seal is broken, weigh or otherwise determine that full charge of dry chemical is in extinguisher. Recharge if pressure is low or if dry chemical is needed.
Vaporizing liquid[2] (pump type).	Pump a few strokes into clean pail and replace liquid. Keep water out of extinguisher or liquid. Keep extinguisher completely full of liquid.
Vaporizing liquid[2] (stored pressure type).	See that pressure gage is in operating range. Weigh or check liquid level to determine that full charge of liquid is in extinguisher. Recharge if pressure is low or if liquid is needed.

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

[2] Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels. (See § 95.50–5(c) of this subchapter.)

(2) Fixed fire-extinguishing systems shall be checked as noted in Table 91.25-20 (a) (2). In addition, all parts of the fixed fire-extinguishing systems, shall be examined for excessive corrosion and general conditions.

TABLE 91.25-20 (a) (2)

Type system	Test
Foam	Systems utilizing a soda solution shall have such solution replaced. In all cases, ascertain that powder is not caked.
Carbon dioxide.	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge.[1]

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

(3) On all fire-extinguishing systems, all piping controls, valves, and alarms shall be checked to ascertain that the system is in operating condition. In this respect, steam smothering lines shall be checked with at least a 50 p. s. i. air pressure with the ends capped or by blowing steam through the lines at the designed pressure.

(4) The fire main system shall be operated and the pressure checked at the most remote and highest outlets. All firehose shall be subjected to a test pressure equivalent to the maximum pressure to which they may be subjected in service, but not less than 100 p. s. i.

§ 91.25-25 Hull equipment.

(a) At each inspection for certification, the inspectors shall conduct the following tests and inspections of hull equipment:

(1) All watertight doors shall be operated locally by manual power and also by hydraulic or electric power if so fitted. Where remote control is fitted, the doors shall also be operated by the remote control apparatus.

(2) The remote controls of all valves shall be operated.

(3) An inspection of the cargo gear shall be required. The inspection may consist of tests and examinations to determine the condition and suitability of the cargo gear. Current valid certificates and registers of cargo gear, issued by recognized nonprofit organizations or associations approved by the Commandant, may be accepted as prima facie evidence of the condition and suitability of the cargo gear. Cargo gear certificates and registers will not be issued by the Coast Guard.

(b) Every acceptable cargo gear certificate and/or register shall be properly executed by a person authorized to do so and shall:

(1) Certify as to the tests and examinations conducted;

(2) Show the dates on which the tests and examinations were conducted; and

(3) Indicate that the cargo gear therein described complies with standards equal to or exceeding those set forth in Subpart 91.37.

(c) Competent persons for the purposes of this section and Subpart 91.37 are:

(1) Coast Guard marine inspectors;

(2) Surveyors of the organizations or associations approved by the Commandant;

(3) Such other persons as are authorized by the regulations in Subpart 91.37 as may be required; and,

(4) Responsible officials or employees of the testing laboratories, companies, or organizations who conduct tests of pieces of loose cargo gear, wire rope, or the annealing of gear as may be required.

(d) The registers issued in connection with cargo gear certification must have all required entries fully completed as of the dates indicated, shall be kept current, and shall include the following:

(1) A register of the cargo handling machinery and the gear accessory thereto carried on the vessel named therein;

(2) Certification of the testing and examination of winches, derricks, and their accessory gear;

(3) Certification of the testing and examination of cranes, hoists, and their accessory gear;

(4) Certification of the testing and examination of chains, rings, hooks, shackles, swivels, and blocks;

(5) Certification of the testing and examination of wire rope;

(6) Certification of the heat-treatment of chains, rings, hooks, shackles, and swivels which require such treatment; and,

(7) Certification of the annual thorough examinations of gear not required to be periodically heat-treated.

(e) It is the responsibility of the master to have a ship's officer inspect cargo gear when required by Subpart 91.37. For those inspected vessels which do not have valid cargo gear certificates and registers as provided by this section, such vessels will be required to have their shipboard cargo gear undergo tests and examinations in accordance with the provisions of Subpart 91.37.

§ 91.25-30 Electrical engineering equipment.

(a) For inspection procedures of electrical engineering equipment and systems see Subchapter J (Electrical Engineering) of this chapter.

§ 91.25-35 Marine engineering equipment.

(a) For inspection procedures of marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

§ 91.25-37 Tanks containing dangerous cargoes.

(a) For inspection and tests of tanks containing certain dangerous cargoes in bulk, see Part 98 of this subchapter.

(R.S. 4472, as amended; 46 U.S.C. 170)

§ 91.25-40 Sanitary inspection.

(a) At each inspection for certification, the quarters, toilets, and washing spaces, galleys, serving pantries, lockers, etc., shall be examined by the inspector to be assured that they are in a sanitary condition.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

§ 91.25-45 Fire hazards.

(a) At each inspection for certification, the inspector shall examine the tank tops and bilges in the machinery spaces to see that there is no accumulation of oil which might create a fire hazard.

§ 91.25-50 Inspector not limited.

(a) Nothing in this subpart shall be construed as limiting the ihspector from making such tests or inspections as he deems necessary to be assured of the safety and seaworthiness of the vessel.

Subpart 91.27—Reinspection

§ 91.27-1 When made.

(a) At least one reinspection shall be made on each vessel holding a certificate of inspection valid for two years. This reinspection will be made, where possible, between the tenth and fourteenth month of the period for which the certificate is valid.

(b) No written application for reinspection will be required.

§ 91.27-5 Scope.

(a) The inspector shall examine all accessible parts of the vessel's hull, machinery, and equipment to be assured that it is in a satisfactory condition.

(b) In general, the scope of the reinspection shall be the same as for the inspection for certification, but will be in less detail unless it is determined that a major change has occurred since the last inspection.

§ 91.27-10 Deficiencies in maintenance.

(a) If the reinspection reveals deficiencies in the maintenance as called for by the regulations in this subchapter, such necessary repairs or improvements shall be made as may be ordered.

§ 91.27-15 Inspectors not limited.

(a) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the seaworthiness of the vessel.

Subpart 91.30—Inspection After Accident

§ 91.30-1 General or partial survey.

(a) A survey, either general or partial, according to the circumstances, shall be made every time an accident occurs or a defect is discovered which affects the safety of the vessel or the efficacy or completeness of its lifesaving appliances, fire-fighting or other equipment, or whenever any important repairs or renewals are made. The survey shall be such as to insure that the necessary repairs or renewals have been effectively made, that the material and the workmanship of such repairs or renewals are in all respects satisfactory, and that the

vessel complies in all respects with the regulations in this subchapter.

(R.S. 4450, as amended; 46 U.S.C. 239)

Subpart 91.35—Sanitary Inspections

§ 91.35–1 When made.

(a) An inspection of quarters, toilet and washing spaces, serving pantries, galleys, etc., shall be made at least once in every month. If the route of the vessel is such that it is away from a United States port for more than one month, an inspection shall be conducted at least once every trip.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

Subpart 91.37—Inspection of Cargo Gear

§ 91.37–1 When made.

(a) The specific tests and examinations shall be made at the intervals stated in the regulations in this subpart.

(b) A thorough examination of the assembled gear shall be made at least once in every year.

(c) An inspection to determine the condition and suitability of shipboard cargo gear will be made by a marine inspector at each inspection for certification. Inspections may be made at such other times as considered necessary by the Officer in Charge, Marine Inspection.

(d) For vessels fitted with cargo gear, an initial test of the assembled units under proof loads shall be conducted, followed by a complete dismantling or disassembling of such gear and a thorough examination of the parts to ascertain its condition. Subsequent tests of the assembled units under proof loads, followed by a dismantling or disassembling of such gear and a thorough examination shall be made once every 4 years, or oftener if necessary.

§ 91.37–3 Definitions of terms and words used in this subpart.

(a) *Cargo gear.* The term "cargo gear" includes masts, stays, booms, winches, cranes, elevators, conveyors, standing and running gear forming that part of the shipboard cargo gear used in connection with the loading or unloading of a vessel. This term does not include material handling gear and rigging of special design vessels used solely in dredging, pile driving, drilling for mineral deposits, and construction work.

(b) *Dismantling or disassembling of gear.* The "dismantling" or "disassembling" of gear contemplated is the taking apart of units of gear to the extent necessary to determine the suitability of such gear for continued service and as may be specifically required to carry out the intent of a particular regulation in this subpart. After proof load tests the disassembling need not include the sheaves and pins of the blocks included in the test unless there appears to be evidence of deformation or failure.

(c) *Thorough examination.* The "thorough examination" contemplated is a visual examination, supplemented if necessary by other means such as by a hammer test or by a test with electronic or ultrasonic devices.

(d) *Ton.* The word "ton" means a ton of 2,240 pounds.

(e) *Safe working load.* The "safe working load" (SWL) contemplated is the load the gear is approved to lift, excluding the weight of the gear itself.

§ 91.37–5 Tests and examinations of shipboard cargo gear.

(a) For vessels fitted with cargo gear and without valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, inspections shall be made by competent persons described in § 91.25–25(c)(1) and (2) to determine the condition and suitability of the shipboard cargo gear. For the initial and subsequent quadrennial inspections, all the cranes, winches, hoists, derrick booms, derrick and mast bands, and all parts used in loading or unloading cargo shall be assembled in units and such assembled units shall then be tested under proof loads. The proof loads shall be handled for various types of units as required by specific regulations in this subpart. After the proof load tests of the assembled units of gear have been made, such gear shall be disassembled or dismantled so as to permit them to be thoroughly examined. The sheaves and pins of the blocks included in these proof load tests need not be removed unless there appears to be evidence of deformation or failure.

(b) For vessels fitted with cargo gear and holding valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, the marine inspectors may accept such certificates as prima facie evidence of compliance with the requirements in this subpart. If an Officer in Charge, Marine Inspection, is in doubt as to the condition and suitability of shipboard cargo gear for such a vessel, the tests and examinations, or such portions thereof as deemed necessary, provided for in this subpart will be required.

(c) If any part or portion of the gear fails or becomes defective during such tests, such defective equipment shall be satisfactorily repaired or replaced.

§ 91.37–10 Cargo gear of special design and limited use.

(a) The regulations in this subpart shall apply to cargo gear of special design and limited use (derrick barges rigged for heavy lifts, cargo booms on self unloaders, etc.) only to the extent that it is practicable to do so. These requirements may be modified by the Officer in Charge, Marine Inspection, where the inspection is performed according to the design characteristics of such cargo gear.

(b) Nondestructive tests, such as radiography, ultrasonic, electronic or other methods, may be utilized to determine the condition of heavy lift gear after it has been unit tested, provided such methods are acceptable to the Officer in Charge, Marine Inspection, having cognizance of the tests. However, no deviations or modifications shall be permitted to lessen the requirements for cargo gear inspection as set forth in § 91.37–70 and the maintenance of the applicable cargo gear records as set forth in § 91.37–75.

§ 91.37–15 Cargo gear plans required when plans are not approved by a classification society.

(a) For a new vessel or a vessel applying for initial inspection, the following plans of cargo gear shall be submitted in triplicate to the Officer in Charge, Marine Inspection, having jurisdiction for approval:

(1) Plans showing a stress diagram with the principal details of the gear.

(2) Plans containing a diagram showing the arrangement of the assembled gear and indicating the safe working load for each component part.

(b) The safe working load on which the design of any component part of the cargo gear is to be based, shall be taken as the maximum resultant load upon the component part in the design conditions assumed. The safe working load of the assembly is the load the gear is approved to lift, excluding the weight of the gear itself.

(c) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 91.37–20 Cargo gear plans approved by a classification society.

(a) The plans required by § 91.37–15(a) need not be submitted to the Officer in Charge, Marine Inspection, for approval if such plans are or have been approved by the American Bureau of Shipping or similar classification society recognized by the Commandant.

(b) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 91.37–25 Factors of safety.

(a) In the design of the cargo gear, the safety factors in Table 91.37–25(a), taken in association with suitable design assumptions for actual loading conditions, shall be used and regarded as minima.

TABLE 91.37–25(a)

Safe working loads for component parts	Safety factors based on—		
	Ultimate strength	Yield point	Breaking test load
All metal structural parts, except steel booms:			
When the working load of the assembled gear is 10 tons or less	[1] 5	----	----
When the working load of the assembled gear is 13 tons or over	[1] 4	----	----
Steel booms:			
When the working load of the assembled gear is 10 tons or less	----	[1] 3	----
When the working load of the assembled gear is 13 tons or over	----	[1] 2½	----
Wooden structural parts	8	----	----
Chains	4½	----	----
Wire rope:			
For working loads 10 tons or under	----	----	5
For working loads over 10 tons	----	----	* 4
Fiber rope:			
When intended for running rigging	7	----	----
When intended for fixed gear and vangs	5	----	----

[1] For working loads between 10 and 13 tons, intermediate values of safety factors may be used.

(b) The Commandant will give consideration to the use of factors of safety differing from those given in Table 91.37-25(a) where special materials or cargo gear of special design are to be used.

§ 91.37-30 Loose gear certificates and tests.

(a)(1) Evidence of compliance with the proof load test requirements in this section for all chains, rings, hooks, links, shackles, swivels, blocks, and any other loose gear whether accessory to a machine or not, but which is used as ship's cargo gear shall be listed on an appropriate certificate.

(2) This evidence of test and the recording thereof is required only once with respect to each article of gear so long as each article is identified and the certificates required are available on the vessel.

(3) Proof loads applied to the articles of loose gear shall be as shown in Table 91.37-30(a)(3).

TABLE 91.37-30(a)(3)

Articles of gear	*Proof load*
Chains, rings, hooks, links, shackles, swivels	Twice the safe working load.
Single sheave block	Four times the safe working load.[1]
Multiple sheave block with safe working load up to and including 20 tons.	Twice the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons.	20 tons in excess of the safe working load.
Multiple sheave block over 40 tons	One and a half times the safe working load.
Roller chains (pitched chains) used with hand operated chain falls, and rings, hooks, shackles, or swivels permanently attached thereto.	Do.
Chain fall blocks used with roller chains (pitched chains), and rings, hooks, shackles, or swivels permanently attached thereto.	Do.

[1] The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin when lifting the safe working load attached to a rope which passes around the sheave of the block. The proof load is, therefore, equal to four times the safe working load or twice the safe working load when the load is attached directly to the block instead of a rope passing around the sheave.

(b) All chains, rings, hooks, links, shackles, swivels, blocks and any other loose gear whether accessory to a machine or not, but which is used or intended for use as ship's cargo gear, shall bear a mark or number by which each piece can be identified and shall be listed on a loose gear certificate. The safe working load "SWL" shall be marked on all blocks.

(c) The certificate shall show the distinguishing number or mark applied to the articles of gear; a description of the articles of gear; the date when the test proof load was applied; and the safe working load. The forms for loose gear certificates shall be as prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes of this section.

(d) After being tested all of the gear shall be examined to ascertain whether any part has been damaged, permanently deformed by the test or has other visible defects. The pins and sheaves of all tested blocks shall be removed for this purpose. If damaged during these tests, such gear shall be satisfactorily repaired or replaced.

(e) The required examinations as set forth in paragraph (d) of this section may be accomplished by mechanical, electrical or other means provided the method employed is equal in efficiency to the visual examination of disassembled gear.

§ 91.37-35 Test and certification of wire rope.

(a) All wire rope used as shipboard cargo gear shall be able to withstand a breaking test load of at least five times the safe working load. In the case of gear with a lifting capacity of over 10 tons, the breaking test load of wire rope shall be at least four times the safe working load. All wire rope shall be identified and described in a wire rope certificate. Such certificate shall be furnished and attested to by the manufacturer or a testing agency and shall certify:

(1) The breaking test load of a sample of the wire rope, which should be at least five times the safe working load or at least four times the safe working load if part of gear with a lifting capacity of over 10 tons;

(2) The name and address of the manufacturer;

(3) The diameter of the rope in inches and/or fractions thereof;

(4) The number of strands and the number of wires in each strand;

(5) The quality of the wire (e.g. improved plow steel);

(6) The date of the test; and,

(7) The load at which the sample broke.

(b) The forms for the wire rope certificates shall be presented by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(c) In addition to the manufacturers' or testing agencies' attestations, a sample of the wire rope may be tested to destruction if required by the marine inspector when a visual inspection indicates an apparent defective condition.

§ 91.37-40 Proof test of cargo gear as a unit.

(a) Winches with their accessory gear, including the derricks and attachments, at least once in each four years, shall be tested as a unit with proof loads exceeding the safe working load as set forth in Table 91.37-40(a).

TABLE 91.37-40(a)

Safe working load of assembled gear	*Proof load*
Not exceeding 20 tons	25 percent in excess.
Over 20 tons but not exceeding 50 tons.	5 tons in excess.
Over 50 tons	10 percent in excess.

(b) The proof load applied to winches and their gear shall be lifted with the ship's normal tackle including the winches and with the boom at an angle which should not be greater than 15 degrees to the horizontal or to the lowest angle approved in association with the design, or when these angles are impracticable to the lowest practicable angle. When the load has been lifted, it shall be swung as far as possible in both directions.

(1) Where electrical winches are fitted with electromagnetic or hydraulic brakes at the winch, mechanical brakes for manual operation will not be required, but if so fitted shall be in satisfactory operating condition.

(2) Current for electric winch operation during the test shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

(c) Cranes and other hoisting machines with their accessory gear, at least once in each four years, shall be tested with a proof load which shall exceed the safe working load as set forth in Table 91.37-40(a).

(d) The proof load applied to cranes and hoists shall be lifted, topped and swung (slewed) as far as possible in each direction. If the boom of the crane has a movable radius, it shall be tested with a proof load as set forth in this section at the maximum and minimum radii of the boom. In the case of hydraulic cranes whose capacity is limited by pressure, and with which it is not possible to lift a load 25 percent in excess of the safe working load, the greatest possible load in excess of the safe working load shall be used. These tests and the amounts of the loads shall be recorded.

(e) After satisfactory completion of the proof load testing of the cargo gear in accordance with paragraphs (a), (b), (c) and (d) of this section, the cargo gear and all component parts shall be given a thorough visual examination, supplemented as necessary by other means such as a hammer test or with electronic or ultrasonic devices, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use. If found defective, such gear shall be replaced.

(1) When the test is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless

there appears to be evidence of deformation or failure.

(2) For subsequent tests such parts of the machinery and gear shall be dismantled and/or disassembled after the test as necessary to determine its suitability for continued service.

(f) Appropriate means shall be provided to prevent the foot of the boom from being accidentally lifted from the socket during the test.

(g) Vessels whose cargo gear has been in use but are without the valid registers and certificates described in § 91.25–25 shall be inspected for defective cargo gear. The gear shall then be tested and examined as prescribed in this section. If the movable weights for proof testing are not reasonably available, a spring or hydraulic scale certified for accuracy may be used. Whenever such scales are used, the proof load shall be applied with the boom swung out as far as possible in one direction and then in the other direction and at such intermediate positions as may be indicated. At any position, the indicator of the scale must maintain a constant reading under the proof load for a period of five minutes.

(h) On all types of winches and cranes efficient means shall be provided to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated.

(1) Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or cranes shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator.

(2) Current for electric winches and crane operation during the tests shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

§ 91.37–45 Marking of booms and cranes.

(a) The safe working load (abbreviated "SWL") for the assembled gear shall be marked on the heel of each boom with the minimum angle to the horizontal for which the gear is designed. These letters and figures shall be in contrasting colors to the background and at least one inch in height.

(b) Where the boom is rated at varying capacities depending on the radius, tables indicating the maximum safe working loads for the various working angles of the boom and the maximum and minimum radii at which the boom may be safely used shall be conspicuously posted near the controls and visible to the operator when working the gear.

§ 91.37–50 Use of wire rope and chains.

(a) An eye splice made in any wire rope used as cargo gear, with or without a thimble, shall have at least three tucks with whole strands and two tucks with one half the wire cut from the tucking stand: *Provided,* That this requirement shall not preclude the use of any other form of splice or connection if it is as efficient as the splice specified.

(b) Single wire rope cargo falls, wire rope pendants, topping lifts and preventers shall consist of clear lengths without splices except at the working ends. Wire rope clips shall not be used to form eyes in the working ends of single wire rope cargo falls.

(c) Wire rope shall not be used for shipboard cargo gear if in any length of 8 diameters, the number of visible broken wires exceeds ten percent of the total number of wires in the rope, or if the rope shows other signs of excessive wear, corrosion, kinking, or defect.

(d) Hoisting or sling chains used for shipboard cargo gear shall not be used if a length of chain has been stretched more than five percent of the original length, or the chain has become unsafe through overloading or faulty heat-treatment, or whenever other external defects are evident.

(e) Chains used for shipboard cargo gear shall not be shortened by knotting, bolting, or wiring the links. The use of chains having a knot or kink as shipboard cargo gear is prohibited.

§ 91.37–55 Annealing.

(a) Chains, hooks, rings, links, shackles, and swivels of wrought iron used as cargo gear shall be annealed at the following intervals:

(1) Wrought iron chains and gear in general use and of one-half inch or less, at least once in every six months.

(2) All other wrought iron chains and gear, including topping lift chains, in general use, at least once in every twelve months.

(b) The annealing shall be done in a suitable closed oven and not over an open fire. Wrought iron shall be annealed at a temperature of between 1100° and 1200° Fahrenheit for a period of between 30 and 60 minutes. After being annealed, the article shall be allowed to cool slowly and shall be then tested completely for defects.

(c) The heat-treatment of the cargo gear shall be done only by reputable firms having suitable equipment and personnel trained for this purpose. A certificate attesting to the annealing of all gear heat-treated shall be furnished to the vessel.

(d) The heat-treatment of chains, hooks, rings, links, shackles, and swivels of materials other than wrought iron used as cargo gear, if required, shall be effected in accordance with the manufacturers' instructions.

§ 91.37–60 Additions to gear.

(a) When articles of loose gear and/or wire rope conforming with the requirements in this subpart are added to installed gear, or used as replacements in such gear from time to time, a record shall be maintained on the vessel which shall identify each article and the certificate accompanying it.

§ 91.37–65 Alterations, renewals, or repairs of cargo gear.

(a) Whenever important repairs, renewals, or alterations are indicated or intended for the masts, booms, and permanent fittings of the cargo gear, such repairs, renewals, or alterations shall be undertaken only after compliance with the applicable provisions of § 91.45–1.

(b) Tests and examinations of the repairs, renewals, or alterations shall be in accordance with the provisions of § 91.37–40.

(c) When welding is used to lengthen, alter, or repair chains, rings, hooks, links, shackles, or swivels, they shall be properly heat-treated and shall before being again put into use, be tested and examined in accordance with the provisions of § 91.37–30.

§ 91.37–70 Responsibility of ship's officer for inspection of cargo gear.

(a) All wire rope, chains other than bridle chains attached to booms or masts, and all rings, hooks, links, shackles, swivels and blocks used in loading or unloading shall be visually inspected by a ship's officer designated for that purpose by the master.

(b) These inspections by a ship's officer shall be made at frequent intervals, and in any event not less than once in each month.

(c) Immediately after such an inspection by a ship's officer notations of such an inspection shall be made in record form which shall be in or kept with the cargo gear register if carried. In addition, the same notations of inspections together with the date shall be entered in the Official Logbook for those vessels required to carry this record, or such information shall be kept with the log records maintained on vessels not required to carry the Official Logbook. (See § 91.37–75 for entries required to be kept.)

§ 91.37–75 Records regarding cargo gear.

(a) The cargo gear records described in this subpart shall be maintained on the vessel and shall be made available to Coast Guard officials upon request. These records shall be kept for the periods of time they are valid and, in addition, until the next Coast Guard inspection for certification of the vessel. The certificates of manufacturers and/or testing laboratories, companies, or organizations shall be maintained on the vessel so long as the gear described in such certificates is on board the vessel.

(b) The records of all the inspections of cargo gear made by the ship's officers in accordance with § 91.37–70 shall be maintained on the vessel for periods of time which agree with those periods as covered by the current Coast Guard certificate of inspection issued to the vessel. These records show the dates of inspections, identify articles inspected, the conditions observed, and the name of the officer performing the inspection.

(c) The records of all tests and examinations conducted by or under the supervision of surveyors of the organizations or associations approved by the Commandant shall be maintained on the vessel.

(d) The Coast Guard will not issue cargo gear certificates and/or registers. The Coast Guard's records of inspections, tests, and examinations of a particular vessel's cargo gear made by a

marine inspector or conducted under the supervision of the Coast Guard will be maintained in the office of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel at the time such work was performed. The original certificates or certified copies of certificates of manufacturers and/or testing laboratories, companies, or organizations for loose cargo gear, wire rope, or the annealing of gear shall be maintained on the vessel.

§ 91.37–80 Advance notice that cargo gear testing is desired.

(a) The owner, agent, or master of a vessel shall give an advance notice when it is desired that the tests and examinations of cargo gear be made by or under the supervision of the marine inspector. This advance notice shall be given to the Officer in Charge, Marine Inspection, in whose marine inspection zone the vessel is available for such inspection and examination.

(b) For the initial inspection and examination of cargo gear by the Coast Guard, the advance notice shall be to the cognizant Officer in Charge, Marine Inspection, as early as possible and shall include sketches and/or drawings showing each unit of cargo gear, the identification of component parts and the safe working loads. Copies of original certificates of manufacturers and/or testing laboratories, companies, or organizations maintained on the vessel may be accepted by the cognizant Officer in Charge, Marine Inspection, when satisfied such certificates properly describe the qualities of the component parts of the gear in question.

§ 91.37–85 Responsibility for conducting required tests and examinations.

(a) The vessel's owners and/or operators shall furnish and pay the expenses required in conducting the tests and examinations prescribed by the regulations in this subpart, including the supplying of all instruments, other equipment, and personnel including personnel supervision for performance of all work required.

(b) The Coast Guard's participation in these required tests and examinations shall be confined to witnessing required tests and examinations with the view to determining whether or not the gear is satisfactory for the purpose intended. In the event it is determined that the gear is defective or unable to meet the standards set forth in this subpart such gear, or portions thereof, shall be replaced to the satisfaction of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel.

Subpart 91.40—Drydocking

§ 91.40–1 When required.

(a) Except for extensions as authorized by the Commandant, all vessels shall be placed in drydock or hauled out for examination within the periods set forth in this paragraph, depending upon the service.

(1) Each vessel should be drydocked or hauled out at intervals not to exceed 18 months if it operates in salt water an aggregate of more than 9 months in the 18-month period since it was last drydocked or hauled out.

(2) Each vessel shall be drydocked or hauled out at intervals not to exceed 36 months if it operates in salt water an aggregate of more than 3 months but not more than 6 months in each 12-month period since it was last drydocked or hauled out. When a vessel exceeds an aggregate of 6 months service in salt water in any 12-month period since it was last drydocked or hauled out, it shall be drydocked or hauled out within 6 months after the end of that period or within the 36-month interval, whichever is earlier.

(3) Each vessel shall be drydocked or hauled out at intervals of 48 months if it operates in salt water an aggregate of more than one month but not more than 3 months in each 12-month period since it was last drydocked or hauled out.

(4) Each vessel shall be drydocked or hauled out at intervals not to exceed 60 months if it operates in salt water an aggregate not exceeding one month in each 12-month period since it was last drydocked or hauled out.

§ 91.40–5 Notice by owner.

(a) The master, owner, or agent shall notify the Officer in Charge, Marine Inspection, when any vessel is to be placed on a drydock in order that an examination of the underwater portion of the vessel may be made if deemed necessary.

Subpart 91.45—Repairs and Alterations

§ 91.45–1 Notice required.

(a) No repairs or alterations affecting the safety of the vessel with regard to the hull, machinery, or equipment, shall be made without the knowledge of the Officer in Charge, Marine Inspection.

(b) Drawings of alterations shall be approved before work is started unless deemed unnecessary by the Officer in Charge, Marine Inspection.

(c) Drawings will not be required for repairs in kind.

§ 91.45–5 Inspection required.

(a) An inspection either general or partial depending upon the circumstances shall be made whenever any important repairs or alterations are undertaken.

Subpart 91.50—Special Operating Requirements

§ 91.50–1 Inspection and testing required when making alterations, repairs, or other such operations involving riveting, welding, burning or like fire-producing actions.

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, shall be used as a guide in conducting the inspections and issuance of certificates required by this section.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(1) Within or on the boundaries of cargo tanks which have been used to carry combustible liquids or chemicals in bulk; or,

(2) Within spaces adjacent to cargo tanks which have been used to carry Grade D combustible liquid cargo, except where the distance between such cargo tanks and the work to be performed is not less than twenty-five (25) feet; or,

(3) Within or on the boundaries of fuel tanks; or,

(4) To pipelines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks; or,

(5) On miscellaneous vessels such as cable, salvage, pile driving, and oil drilling rig vessels that have been specially authorized to carry Grade B or Grade C flammable liquid cargo in bulk by the Commandant, within or on the boundaries of such cargo tanks or within spaces adjacent to such cargo tanks.

(c) Such inspections shall be made and evidenced as follows:

(1) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started. Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required. Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) When not in such a port or place, and a marine chemist or such person authorized by the Officer in Charge, Marine Inspection, is not reasonably available, the inspection shall be made by the senior officer present and a proper entry shall be made in the vessel's logbook.

(d) It shall be the responsibility of the senior officer present to secure copies of certificates issued by the certified marine chemist or such person authorized by the Officer in Charge, Marine Inspection. It shall be the responsibility of the senior officer present, insofar as the persons under his control are concerned, to maintain a safe condition on the vessel by full observance of all qualifications and requirements listed by the marine chemist in the certificate.

Subpart 91.55—Plan Approval

AUTHORITY: The provisions of this Subpart 91.55 interpret or apply R.S. 4490, as amended, sec. 3, 24 Stat. 129, as amended; 46 U.S.C. 482, 483.

§ 91.55–1 General.

(a) The following list of required plans is general in character, but includes all plans which normally show construction and safety features coming under the cognizance of the Coast Guard. In the case of a particular vessel, all of the plans enumerated may not be applicable, and it is intended that only those plans and specifications be submitted as will clearly show the vessel's arrangement, construction and required equipment.

(b) In the following list of required plans, the items which must be approved by the American Bureau of Shipping for vessels classed by that organization are indicated by an asterisk. When prints bearing record of such approval by the American Bureau of Shipping are forwarded to the Coast Guard they will in general be accepted as satisfactory except insofar as the law or the Coast Guard regulations contain requirements which are not covered by the American Bureau of Shipping.

§ 91.55–5 Plans and specifications required for new construction.

(a) *General.* (1) Specifications.

(2) General Arrangement Plan of decks, holds, inner bottoms, etc., and including inboard and outboard profile.

(b) *Hull structure.*[1] (1) *Inner Bottom Plating and Framing.

(2) *Midship Section.

(3) *Shell Plating and Framing.

(4) *Stem, Stern Frame, and Rudder.

(5) *Structural Deck Plans for Strength Decks.

(6) *Pillars and Girders.

(7) *Watertight and Oiltight Bulkheads.

(8) *Foundations for Main Machinery and Boilers.

(9) *Arrangement of Ports, Doors, and Airports in Shell Plating.

(10) *Hatch Coamings and Covers in Weather and Watertight Decks.

(11) *Details of Watertight Doors and Operating Gear.

(12) *Scuppers and Drains Penetrating Shell Plating.

(13) *Arrangement of the cargo gear including a stress diagram. The principal details of the gear and the safe working load for each component part shall be shown.

(c) *Hull calculations, etc.* Required only when a stability test is to be performed.

(1) Lines (for information).

(2) Curves of Form.

(3) Capacity Plan showing capacities and vertical and longitudinal centers of gravity of cargo spaces, tanks, etc. (for information).

(4) Tank Sounding tables (for information).

(5) Draft Mark Locations (for information).

(d) *Fire control.* (1) General arrangement plans showing for each deck the control stations, the various fire sections enclosed by fire resisting bulkheads, the arrangement of the alarm and extinguishing systems, the fire extinguishers, means of access to different compartments and decks and the ventilation system including location of ventilation shutdowns, positions of dampers and the numbers identifying each system.

(2) Ventilation diagram including dampers and other fire control features.

(3) Details of alarm systems.

(4) Details of extinguishing systems, including fire mains, carbon dioxide, foam and sprinkling systems.

(e) *Marine engineering.* For plans required for marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

(f) *Electrical engineering.* For plans required for electrical engineering, equipment and systems, see Subchapter J (Electrical Engineering) of this chapter.

(g) *Lifesaving equipment.* (1) These plans are to show the location and arrangement of embarkation decks, all overboard discharges and projections in way of launching lifeboats, weights of lifeboats fully equipped and loaded, working loads of davits and winches, types and sizes of falls, the manufacturer's name and identification for all equipment, and all other relevant and necessary information.

(i) Arrangement of lifeboats.

(ii) Arrangement of davits.

(iii) Location and stowage of liferafts and buoyant apparatus.

(h) *Crew's accommodations.* (1) Arrangement plans showing accommodations, ventilation, escapes, hospital, and sanitary facilities for all crewmembers.

§ 91.55–10 Plans required for alterations of existing vessels.

(a) In the event of alterations involving the safety of the vessel, the applicable plans shall be submitted for approval covering the proposed work except as modified by § 91.45–1. The general scope of the plans shall be as noted in § 91.55–5.

§ 91.55–15 Procedure for submittal of plans.

(a) As the relative location of shipyards, design offices, and Coast Guard offices vary throughout the country, no specific routing will be required in the submittal of plans. In general, one of the following procedures would apply, but in a particular case, if a more expeditious procedure can be used, there will be no objection to its adoption.

(1) The plans may be submitted to the Officer in Charge, Marine Inspection, in the district in which the vessel is to be built. This procedure will be most expeditious in the case of those offices where personnel and facilities are available for examination and approval of the plans locally.

(2) The plans may be submitted directly to the Commandant (MMT), U. S. Coast Guard, 1300 "E" Street NW., Washington, D.C., 20226. In this case, the plans will be returned directly to the submitter, with a copy of the action being forwarded to the interested Officer in Charge, Marine Inspection.

(3) The plans may be submitted directly to field technical offices.

(i) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for the geographical area covered by 1st, 3d and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, New Orleans, La., 70130, for geographical area covered by 2d, 7th and 8th Coast Guard Districts.

(iii) Commander, 12th Coast Guard District (mmt), 630 Sansome St., San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th and 17th Coast Guard Districts.

(4) In the case of classed vessels, upon specific request by the submitter, the American Bureau of Shipping will arrange to forward the necessary plans to the Coast Guard indicating its action thereon. In this case, the plans will be returned as noted in subparagraph (2) of this paragraph.

§ 91.55–20 Number of plans required.

(a) Four copies of each plan are normally required so that one can be returned to the submitter. If the submitter desires additional approved plans, a suitable number should be submitted to permit the required distribution.

Subpart 91.60—Certificates Under International Convention for Safety of Life at Sea, 1960

§ 91.60–1 Application.

(a) The provisions of this subpart, with the exception of §§ 91.60–30 and 91.60–40(e), shall apply to all cargo vessels on an international voyage other than nuclear vessels.

(b) The provisions of §§ 91.60–30, 91.60–35 and 91.60–40(e) shall apply to all nuclear cargo vessels on an international voyage.

§ 91.60–5 Cargo Ship Safety Construction Certificate.

(a) All vessels on an international voyage are required to have a Cargo Ship Safety Construction Certificate. This certificate shall be issued by the U.S. Coast Guard or the American Bureau of Shipping to certain vessels on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960.

(b) All such vessels shall meet the applicable requirements of this chapter for vessels on an international voyage.

§ 91.60–10 Cargo Ship Safety Equipment Certificate.

(a) All vessels on an international voyage are required to have a Cargo Ship Safety Equipment Certificate.

[1] The asterisk (*) indicates items which may require approval by the American Bureau of Shipping for vessels classed by that society.

(b) All such vessels shall meet the applicable requirements of this chapter for vessels on an international voyage.

§ 91.60–15 Cargo Ship Safety Radiotelegraphy Certificate.

(a) The application for Cargo Ship Safety Radiotelegraphy Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelegraphy Certificate will be issued by the Federal Communications Commission to a vessel meeting its requirements for a vessel fitted with a radiotelegraph installation.

§ 91.60–20 Cargo Ship Safety Radiotelephony Certificate.

(a) The application for a Cargo Ship Safety Radiotelephony Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelephony Certificate will be issued by the Federal Communications Commission to a vessel meeting its applicable requirements for a vessel fitted with a radiotelephone installation.

§ 91.60–25 Exemption Certificate.

(a) A vessel may be exempted by the Commandant from complying with certain requirements of the Convention under his administration upon request made in writing to him and transmitted via the Officer in Charge, Marine Inspection.

(b) When an exemption is granted to a vessel by the Commandant under and in accordance with the Convention, an Exemption Certificate describing such exemption shall be issued through the appropriate Officer in Charge, Marine Inspection, in addition to other required certificates.

§ 91.60–30 Nuclear Cargo Ship Safety Certificate.

(a) All nuclear cargo vessels on an international voyage are required to have a Nuclear Cargo Ship Safety Certificate.

(b) All such vessels shall meet the applicable requirements of this chapter for nuclear vessels on an international voyage.

(c) Nuclear vessels cannot be exempted from any requirements of the Convention.

§ 91.60–35 Posting of Convention certificates.

(a) The certificates described in this subpart, or certified copies thereof, when issued to a vessel shall be posted in a prominent and accessible place on the vessel.

(b) The certificates shall be carried in a manner similar to that described in § 91.01–5 for a certificate of inspection.

§ 91.60–40 Duration of certificates.

(a) A Cargo Ship Safety Equipment Certificate shall be issued for a period of not more than 24 months.

(b) A Cargo Ship Safety Construction Certificate shall be issued for a period of not more than 60 months.

(c) A Cargo Ship Safety Radiotelegraphy Certificate and a Cargo Ship Safety Radiotelephony Certificate shall be issued for a period of not more than 12 months.

(d) An Exemption Certificate shall not be valid for longer than the period of the certificate to which it refers.

(e) The Nuclear Cargo Ship Safety Certificate shall be issued for a period of not more than 12 months.

(f) A Convention certificate may be withdrawn, revoked, or suspended at any time when it is determined the vessel is no longer in compliance with applicable requirements. (See § 2.01–70 of this chapter for procedures governing appeals.)

§ 91.60–45 American Bureau of Shipping.

(a) The American Bureau of Shipping, with its home office at 45 Broad Street, New York, N.Y., 10004, is hereby designated as an organization duly authorized to issue the "Cargo Ship Safety Construction Certificate" to certain cargo ships on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960, and Executive Order 11239 and the certificate shall be subject to the requirements in this subpart. The American Bureau of Shipping is authorized to place the official seal of the United States of America on the certificate. This designation and delegation to the American Bureau of Shipping shall be in effect from May 26, 1965, until terminated by proper authority and notice of cancellation is published in the FEDERAL REGISTER.

(b) At the option of the owner or agent of a vessel on an international voyage and on direct application to the American Bureau of Shipping, the Bureau may issue to such vessel a Cargo Ship Safety Construction Certificate, having a period of validity of not more than 60 months after ascertaining that the vessel:

(1) Has met the applicable requirements of the Convention; and,

(2) Is currently classed by the Bureau and classification requirements have been dealt with to the satisfaction of the Bureau.

(c) When the Bureau determines that a vessel to which it has issued a Cargo Ship Safety Construction Certificate no longer complies with the Bureau's applicable requirements for classification, the Bureau shall immediately furnish to the Coast Guard all relevant information, which will be used by the Coast Guard to determine whether or not to withdraw, revoke or suspend the Cargo Ship Safety Construction Certificate.

(Sec. 25, 41 Stat. 998, as amended, sec. 701, 62 Stat. 731, as amended; 46 U.S.C. 881, 18 U.S.C. 701)

PART 92—CONSTRUCTION AND ARRANGEMENT

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AUTHORITY: The provisions of this Part 92 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat.

1544, 1545, as amended, sec. 3, 63 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 92.01—Hull Structure

§ 92.01-1 Application.

(a) The provisions of this subpart, with the exception of § 92.01-90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 92.01-90.

§ 92.01-5 Vessels subject to load line.

(a) For vessels assigned a load line, see Subchapter E (Load Lines) of this chapter, for special requirements as to strength, closure of openings, etc.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a. Treasury Department Order 167-48, Oct. 19, 1962, 27 F.R. 10504)

§ 92.01-10 Structural standards.

(a) In general, compliance with the standards established by the American Bureau of Shipping, see Subpart 90.35 of this subchapter, will be considered as satisfactory evidence of the structural efficiency of the vessel. However, in special cases, a detailed analysis of the entire structure or some integral part may be made by the Coast Guard to determine the structural requirements.

§ 92.01-13 Sliding watertight doors.

(a) Sliding watertight doors, where fitted, shall be designed, tested, and installed in accordance with Subpart 163.001 of Subchapter Q (Specifications) of this chapter.

§ 92.01-15 Special consideration.

(a) Special consideration will be given to the structural requirements for small vessels or vessels of an unusual design not contemplated by the rules of the American Bureau of Shipping.

§ 92.01-90 Vessels contracted for prior to November 19, 1952.

(a) Existing structure previously approved will be considered satisfactory so long as it is maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

Subpart 92.05—General Fire Protection

§ 92.05-1 Fire hazards to be minimized.

(a) The general construction of the vessel shall be such as to minimize fire hazards insofar as is reasonable and practicable.

§ 92.05-5 Woodwork insulated from heated surfaces.

(a) Internal combustion engine exhausts, boiler and galley uptakes, and similar sources of ignition shall be kept clear of and suitably insulated from any woodwork or other combustible matter.

§ 92.05-10 Lamp room construction.

(a) Lamp, paint, and oil lockers and similar compartments shall be constructed of steel or shall be wholly lined with metal.

§ 92.05-15 Segregation of spaces containing the emergency source of electric power.

(a) The provisions of this section shall apply to all vessels contracted for on or after October 1, 1958.

(b) When a compartment containing the emergency source of electric power, or vital components thereof, adjoins a space containing either the ship's service generators or machinery necessary for the operation of the ship's service generators, all common bulkheads and/or decks shall be protected by approved "structural insulation" or other approved material. This protection shall be such as to be capable of preventing an excessive temperature rise in the space containing the emergency source of electric power, or vital components thereof, for a period of at least one hour in the event of fire in the adjoining space. Bulkheads or decks meeting Class A-60 requirements, as defined by § 72.05-10 of Subchapter H (Passenger Vessels) of this chapter, will be considered as meeting the requirements of this paragraph.

Subpart 92.07—Structural Fire Protection

§ 92.07-1 Application.

(a) The provisions of this subpart, with the exception of § 92.07-90, shall apply to all vessels of 4,000 gross tons and over contracted for on or after January 1, 1962. Such vessels contracted for prior to January 1, 1962, shall meet the requirements of § 92.07-90.

§ 92.07-5 Definitions.

(a) *Standard fire test.* A "standard fire test" is one which develops in the test furnace a series of time temperature relationships as follows:

5 minutes—1,000° F.
10 minutes—1,300° F.
30 minutes—1,550° F.
60 minutes—1,700° F.

(b) *"A" Class divisions.* Bulkheads or decks of the "A" Class shall be composed of steel or equivalent metal construction, suitably stiffened and made intact with the main structure of the vessel; such as shell, structural bulkheads, and decks. They shall be so constructed, that if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one hour.

(c) *"B" Class bulkheads.* Bulkheads of the "B" Class shall be constructed with approved incombustible materials and made intact from deck to deck and to shell or other boundaries. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one half hour.

(d) *"C" Class divisions.* Bulkheads or decks of the "C" Class shall be constructed of approved incombustible materials, but need meet no requirements relative to the passage of flame.

(e) *Steel or other equivalent metal.* Where the term "steel or other equivalent metal" is used in this subpart, it is intended to require a material which, by itself or due to insulation provided, has structural and integrity qualities equivalent to steel at the end of the applicable fire exposure.

(f) *Approved material.* Where in this subpart approved materials are required, they refer to materials approved under the applicable subparts of Subchapter Q (Specifications) of this chapter, as follows:

Deck Coverings	164.006
Structural Insulations	164.007
Bulkhead Panels	164.008
Incombustible Materials	164.009
Interior Finishes	164.012

§ 92.07-10 Construction.

(a) The hull, superstructure, structural bulkheads, decks, and deckhouses shall be constructed of steel. Alternately, the Commandant may permit the use of other suitable material in special cases, having in mind the risk of fire.

(b) Bulkheads of galleys, paint and lamp lockers, and emergency generator rooms shall be of "A" Class construction.

(c) The boundary bulkheads and decks separating the accommodations and control stations from cargo and machinery spaces, galleys, main pantries and storerooms, other than small service lockers, shall be of "A" Class construction.

(d) Within the accommodation and service areas the following conditions shall apply:

(1) Corridor bulkheads in accommodation spaces shall be of the "A" or "B" Class intact from deck to deck. Stateroom doors in such bulkheads may have a louver in the lower half.

(2) Elevator, dumbwaiter, and other trunks shall be of "A" Class construction.

(3) Bulkheads not already specified to be of "A" or "B" Class construction may be of "A", "B", or "C" Class construction.

(4) The integrity of any deck in way of a stairway opening shall be maintained by means of "A" or "B" class bulkheads and doors at one level. The doors shall be of self-closing type. Holdback hooks will not be permitted. However, magnetic holdbacks operated from the bridge or from other suitable remote control positions are acceptable.

(5) Interior stairs, including stringers and treads, shall be of steel.

(6) Except for washrooms and toilet spaces, deck coverings within accommodation spaces shall be of an approved type. However, overlays for leveling or finishing purposes which do not meet the requirements for an approved deck covering may be used in thicknesses not exceeding 3/8 of an inch.

(7) Ceilings, linings, and insulation, including pipe and duct laggings, shall be of approved incombustible materials.

(8) Any sheathing, furring or holding pieces incidental to the securing of any bulkhead, ceiling, lining, or insulation shall be of approved incombustible materials.

(9) Combustible veneers, trim, decorations, etc. shall not be used in corridors or hidden spaces. This is not intended to preclude the use of an approved Interior Finish or a reasonable number of coats of paint.

(e) Wood hatch covers may be used between cargo spaces or between stores spaces. Hatch covers in other locations shall be of steel or equivalent metal construction. Tonnage openings shall be closed by means of steel plates.

(f) Nitrocellulose or other highly flammable or noxious fume-producing paints or lacquers shall not be used.

§ 92.07–90 Vessels contracted for prior to January 1, 1962.

(a) Existing structure arrangements and materials previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

Subpart 92.10—Means of Escape

§ 92.10–1 Application.

(a) The provisions of this subpart, with the exception of § 92.10–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 92.10–90.

§ 92.10–5 Two means required.

(a) There shall be at least two means of escape from all general areas accessible to the passengers, if carried, or where the crew may be quartered or normally employed. At least one of these two means of escape shall be independent of watertight doors.

§ 92.10–10 Location.

(a) The two means of escape shall be as remote as practicable so as to minimize the possibility of one incident blocking both escapes.

§ 92.10–15 Vertical ladders not accepted.

(a) Vertical ladders and deck scuttles shall not in general be considered satisfactory as one of the required means of escape. However, where it is demonstrated that the installation of a stairway would be impracticable, a vertical ladder may be used as the second means of escape.

§ 92.10–20 No means for locking doors.

(a) No means shall be provided for locking doors giving access to either of the two required means of escape, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided a permanent and conspicuous notice to this effect is attached to both sides of the door. This paragraph shall not apply to outside doors to deckhouses where such doors are locked by key only and such key is under the control of one of the vessel's officers.

§ 92.10–25 Stairway size.

(a) Stairways shall be of sufficient width having in mind the number of persons having access to such stairs for escape purposes.

(b) Vessels contracted for on or after January 1, 1959, shall meet the requirements of this paragraph. Special consideration for relief may be given in the case of small vessels if it is shown to be unreasonable or impracticable to meet the requirements.

(1) All interior stairways, other than those within the machinery spaces or cargo holds, shall have a minimum width of 28 inches. The angle of inclination with the horizontal of such stairways shall not exceed 50 degrees.

§ 92.10–30 Dead end corridors.

(a) Dead end corridors, or the equivalent, more than 40 feet in length shall not be permitted.

§ 92.10–35 Public spaces.

(a) In all cases, public spaces having a deck area of over 300 square feet shall have at least two exits. Where practicable, these exits shall give egress to different corridors, rooms, or spaces to minimize the possibility of one incident blocking both exits.

§ 92.10–40 Access to lifeboats.

(a) The stairways, corridors, and doors shall be so arranged as to permit a ready and direct access to the various lifeboat embarkation areas.

§ 92.10–45 Weather deck communications.

(a) Vertical communication shall be provided between the various weather decks by means of permanent inclined ladders.

§ 92.10–90 Vessels contracted for prior to November 19, 1952.

(a) Existing arrangements previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original design: *Provided,* That in no case will a greater departure from the standards of §§ 92.10–5 through 92.10–45 be permitted than presently exists. Nothing in this paragraph shall be construed as exempting any vessel from having 2 means of escape from all main compartments which are accessible to the passengers, if carried, or where the crew are normally quartered or employed.

Subpart 92.15—Ventilation

§ 92.15–1 Application.

The provisions of this subpart, with the exception of § 92.15–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 92.15–90.

§ 92.15–5 Vessels using fuel having a flashpoint of 110 degrees or lower.

(a) Where liquid fuel having a flashpoint of 110 degrees F. or lower is used for main or auxiliary machinery or for starting purposes, the spaces containing such machinery or fuel tanks shall have ventilation as required by this section.

(1) At least 2 ventilators fitted with cowls or their equivalent for the purpose of properly and effectively ventilating the bilges of every engine and fuel-tank compartment in order to remove any flammable or explosive gases.

(2) Vessels constructed so that the greater portions of the bilges under the engine and fuel tanks are open or exposed to the natural atmosphere at all times are not required to be fitted with ventilators.

§ 92.15–10 Ventilation for closed spaces.

(a) Except as noted in paragraph (c) of this section, all enclosed spaces within the vessel shall be properly vented or ventilated. Means shall be provided to close off all vents and ventilators.

(b) Means shall be provided for stopping all fans in ventilation systems serving machinery and cargo spaces and for closing all doorways, ventilators and annular spaces around funnels and other openings to such spaces, from outside these spaces, in case of fire.

(c) On unmanned cargo barges not fitted with a fixed bilge system, vents and ventilators may be omitted from void spaces.

§ 92.15–15 Ventilation for crew quarters and, where provided, passenger spaces.

(a) All living spaces shall be adequately ventilated in a manner suitable to the purpose of the space.

(b) On vessels of 100 gross tons and over, except for such spaces as are so located that under all ordinary conditions of weather, windows, ports, skylights, etc., and doors to passageways can be kept open, all crew spaces shall be ventilated by a mechanical system, unless it can be shown that a natural system will provide adequate ventilation. However, vessels which trade regularly in the tropics shall, in general, be fitted with a mechanical ventilation system.

§ 92.15–90 Vessels contracted for prior to November 19, 1952.

(a) Existing arrangements previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original design provided that in no case will a greater departure from the standards of §§ 92.15–5 through 92.15–15 be permitted than presently exists.

Subpart 92.20—Accommodations for Officers and Crew

§ 92.20–1 Application.

(a) The provisions of this subpart, with the exception of § 92.20–90, shall apply to all vessels of 100 gross tons and

over contracted for on or after November 19, 1952. Vessels of 100 gross tons and over contracted for prior to November 19, 1952, shall meet the requirements of § 92.20–90.

(b) Vessels of less than 100 gross tons shall meet the applicable requirements of this subpart insofar as is reasonable and practicable.

§ 92.20–5 Intent.

(a) It is the intent of this subpart that the accommodations provided for officers and crew on all vessels shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, arranged, and, where practicable, shall be insulated from undue noise and effluvia.

(b) The crew referred to herein includes all persons, except the licensed officers, regularly employed on board any vessel. Where the requirements for the accommodation of licensed officers are not otherwise specified, they shall be of at least equivalent to that indicated herein for the crew.

(c) For the purpose of this subpart, the term "crew spaces" shall include sleeping rooms, messrooms, recreational rooms, toilet and shower spaces, etc., which are intended for the exclusive use of the crew.

§ 92.20–10 Location of crew spaces.

(a) Crew spaces shall be located, where practicable, so that the maximum amount of fresh air and light are obtainable, having due regard to the service of the vessel and the requirements of other space users.

(b) Crew quarters shall not be located farther forward in a vessel than a vertical plane located at 5 percent of the vessel's length abaft the forward side of the stem at the designed summer load waterline. However, for vessels in other than ocean or coastwise service, this distance need not exceed 28 feet. For the purpose of this paragraph, the length shall be as defined in § 43.15–1 of Subchapter E (Load Lines) of this chapter. No section of the deck of the crew spaces shall be below the deepest load line, except that in special cases, the Commandant may approve such an arrangement: *Provided*, That in no case shall the deck head of the crew space be below the deepest load line.

(c) Hawse pipes or chain pipes shall not pass through crew spaces.

(d) There shall be no direct communication, except through solid, close fitted doors or hatches between crew spaces and chain lockers, cargo, or machinery spaces.

(e) There shall be no access, vents, or sounding tubes from fuel or cargo oil tanks opening into crew spaces, except that sounding tubes and access openings may be located in corridors.

(f) Where practicable, crew spaces shall be located entirely separate and independent of spaces allotted to passengers or licensed officers.

§ 92.20–15 Construction.

(a) All crew spaces are to be constructed in a manner suitable to the purpose for which they are intended. The bulkheads separating the crew space from cargo and machinery spaces, lamp and paint rooms, storerooms, drying rooms, washrooms, and toilet spaces shall be made odorproof where deemed necessary by the Commandant.

(b) Toilet spaces, except when provided as private or semiprivate facilities, shall be so built, fitted, and situated, that no odor from them will readily enter other crew spaces.

(c) Where shell or unsheathed weather decks form boundaries of crew spaces, suitable protective coverings shall be applied to prevent formation or accumulation of moisture.

(d) Where crew spaces adjoin or are immediately above spaces such as galleys, machinery spaces or casings, donkey boilerrooms, etc., they shall be suitably protected from the heat.

(e) The interior sides and deckheads of crew spaces shall be covered with enamel, paint, or other material light in color.

(f) Crew spaces shall be properly drained where considered necessary.

(g) All washrooms and toilet rooms shall be properly drained and so constructed and arranged that they can be kept in a clean, workable, and sanitary condition. The scuppers shall be located in the lowest part of the space, due consideration being given to the average trim of the vessel.

§ 92.20–20 Sleeping accommodations.

(a) *Arrangements.* (1) Separate sleeping accommodations are to be provided for the deck, engine, and steward groups of the crew.

(2) Each watch of seamen, firemen or similar ratings on duty in watches is to be provided with separate sleeping room or rooms, unless the total space for accommodations makes this impracticable.

(3) Where practicable, each licensed officer shall be provided with a separate stateroom.

(b) *Size.* (1) Sleeping accommodations for the crew shall be divided into rooms, no one of which shall berth more than four persons.

(2) Each room shall be of such size that there are at least 30 square feet of deck area and a volume of at least 210 cubic feet for each person accommodated. The clear headroom shall be not less than 6 feet 3 inches. In measuring sleeping quarters allocated to crews of vessels, any equipment contained therein for the use of the occupants is not to be deducted from the total volume or from the deck area.

(c) *Equipment.* (1) Each person shall have a separate berth and not more than one berth shall be placed above another. The berths shall have a framework of metal or other hard, smooth material not likely to corrode or harbor vermin, and shall be so arranged that they provide ample room for easy occupancy. The overall size of a berth shall not be less than 30 inches wide by 76 inches long, except by special permission of the Commandant. Where berths adjoin, they shall be divided by a partition not less than 18 inches in height. Where two tiers of berths are fitted, the bottom of the lower must not be less than 12 inches above the deck, and the bottom of the upper must not be less than 2 feet 6 inches both from the bottom of the lower and from the deck overhead. The berths shall not be obstructed by pipes, ventilating ducts, or other installations.

(2) A locker of metal or other hard, smooth material shall be provided for each person accommodated in a room. Each locker shall be not less than 300 square inches in cross section area and 60 inches high. It shall be so placed as to be readily accessible. The interior of the locker shall be so arranged as to facilitate the proper stowage of clothes.

§ 92.20–25 Washrooms and toilet rooms.

(a) There shall be provided at least one toilet, one washbasin, and one shower or bathtub for each eight members or portion thereof in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private or semiprivate facilities are attached.

(b) Under the following conditions, the toilet and washing facilities for the specific groups of the crew indicated shall be located in spaces separate from the facilities for other crew members; and shall be provided for that group in the ratios required by paragraph (a) of this section.

(1) The members of the engine department, where their number, exclusive of licensed officers, and others separately provided for, exceeds eight.

(2) The members of the steward's department, exclusive of those separately provided for, where their number exceeds eight.

(3) All female members of the crew.

(c) The toilet rooms and washrooms shall be located convenient to the sleeping quarters of the crew to which they are allotted but shall not open directly into such quarters except when they are provided as private or semiprivate facilities.

(d) All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water. Washbasins may be located in the crew sleeping quarters.

(e) The toilet rooms shall be separate from the washrooms and at least one washbasin shall be fitted in each toilet room, except where private or semiprivate facilities are provided and washbasins are installed in the sleeping rooms.

(1) All toilets shall be installed with proper plumbing for flushing. Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefore.

(2) Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes.

§ 92.20–30 Messrooms.

(a) Messrooms shall be located as near to the galley or suitably equipped serving pantry as is practicable, except where messroom is equipped with a steam table. The mess rooms shall be of such size as to seat the number of persons normally scheduled to be eating at one time.

(b) Messrooms shall be properly equipped with tables, seats, and other necessary equipment and shall be so arranged as to permit access to each seat.

§ 92.20–35 Hospital space.

(a) Each vessel, which in the ordinary course of its trade makes voyages of more than three days duration between ports and which carries a crew of twelve or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.

(b) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purpose.

(c) The entrance shall be of such width and in such a position as to admit a stretcher case readily. Berths shall be of metal and may be in double tier, provided the upper berth is hinged and arranged to be secured clear of the lower berth when not in use. At least one berth shall be so arranged that it can be made accessible from both sides when necessary.

(d) The hospital shall be fitted with berths in the ratio of one berth to every twelve members of the crew or portion thereof who are not berthed in single occupancy rooms, but the number of berths need not exceed six.

(e) The hospital shall have a toilet, washbasin, and bath tub or shower conveniently situated. Other necessary suitable equipment of such character as clothes locker, table, seat, etc., shall be provided.

§ 92.20–40 Other spaces.

(a) Sufficient facilities, depending upon the number of the crew, shall be provided where the crew may wash their own clothes. There shall be at least one tub or sink, fitted with the necessary plumbing, including hot and cold running water.

(b) Clothes drying facilities or space shall be provided for the needs of the crew.

(c) Recreation accommodations shall be provided. Where messrooms are used for this purpose, they shall be suitably planned.

§ 92.20–45 Lighting.

(a) All crew spaces shall be adequately lighted in accordance with the requirements of Subchapter J (Electrical Engineering) of this chapter.

(b) Berth lights shall be provided for each member of the crew.

§ 92.20–50 Heating.

(a) All crew spaces shall be adequately heated in a manner suitable to the purpose of the space.

(b) The heating system will be considered satisfactory if it is capable of maintaining a minimum temperature of 70° F. under normal operating conditions without undue curtailment of the ventilation.

(c) Radiators and other heating apparatus shall be so placed, and where necessary shielded, as to avoid risk of fire, danger or discomfort to the occupants. Pipes leading to radiators or heating apparatus shall be lagged where those pipes create a hazard to persons occupying the space.

§ 92.20–55 Insect screens.

(a) Except in such areas as are considered to be insect free, provision shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, airports, ventilators, and doors to unscreened spaces and the open deck or by other methods.

§ 92.20–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels of less than 100 gross tons, contracted for prior to November 19, 1952, shall meet the general intent of § 92.20–5 and in addition shall meet the following requirements:

(1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(b) Vessels of 100 gross tons and over, contracted for prior to March 4, 1915, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction: *Provided*, That in no case will a greater departure from the standards of §§ 92.20–5 through 92.20–55 be permitted than presently exists.

(c) Vessels of 100 gross tons and over, contracted for on or after March 4, 1915, but prior to January 1, 1941, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Where reasonable and practicable, a minimum of one toilet, shower, and washbasin shall be provided for each 10 members of the crew or fraction thereof.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days' duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each twelve members of the crew or fraction thereof, but the number of berths need not exceed six.

(6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.

(d) Vessels of 100 gross tons and over, contracted for on or after January 1, 1941, but prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Washrooms and toilet rooms:

(i) There shall be a minimum of one toilet, shower, and washbasin for each 8 members of the crew or fraction thereof who are not accommodated in rooms having attached private or semiprivate facilities.

(ii) Separate facilities shall be provided for the engineroom, deck, or stewards department when the number of crew in that department, exclusive of officers, exceeds 8.

(iii) Toilet rooms shall be separate from the wash rooms. At least one washbasin shall be installed in each toilet room.

(iv) Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction will be made in the required number of toilets.

(v) Washbasins, showers, and bath tubs if substituted for showers, shall be equipped with proper plumbing including hot and cold running water.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each 12 members of the crew or fraction thereof, but the number of berths need not exceed six.

(6) The crew spaces shall be securely constructed, properly lighted, heated,

drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.

Subpart 92.25—Rails and Guards

§ 92.25–1 Application.

(a) The provisions of this subpart, with the exception of § 92.25–90, shall apply to all vessels contracted for on or after July 1, 1960. Vessels contracted for prior to July 1, 1960, shall meet the requirements of § 92.25–90.

§ 92.25–5 Where rails required.

(a) Rails at least 36 inches high or equivalent protection shall be installed near the periphery of all weather decks accessible to persons on board. Such rails on decks which extend outboard to the side of the vessel shall be in at least three courses approximately evenly spaced. Such rails on decks which do not extend outboard to the side of the vessel, such as tops of deckhouses and winch houses, shall be in at least two courses approximately evenly spaced. If it can be shown to the satisfaction of the Officer in Charge, Marine Inspection, that the installation of rails of such height will be unreasonable and impracticable, having regard to the business of the vessel, rails of a lesser height or in some cases grab rails may be accepted and inboard rails may be eliminated if the deck is not generally accessible.

§ 92.25–10 Storm rails.

(a) On vessels in ocean and coastwise service, suitable storm rails shall be installed in all passageways and at the deckhouse sides where persons on board might have normal access. Storm rails shall be installed on both sides of passageways which are 6 feet or more in width.

§ 92.25–15 Guards in dangerous places.

(a) Suitable hand covers, guards, or rails shall be installed in way of all exposed and dangerous places such as gears, machinery, etc.

§ 92.25–90 Vessels contracted for prior to July 1, 1960.

(a) Existing structure, arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction: *Provided*, That in no case will greater departure from the standards of §§ 92.25–5 through 92.25–15 be permitted than presently exists.

PART 93—STABILITY

Subpart 93.01—Application

Sec.
93.01–1 General.

Subpart 93.05—Stability Test

93.05–1 When required.
93.05–5 Procedure.

Subpart 93.10—Stability Information for Operating Personnel

Sec.
93.10–1 Information supplied to master.

Subpart 93.13—Ballast

93.13–1 When needed.
93.13–5 Fixed ballast.
93.13–10 Liquid ballast.

Subpart 93.15—Stability Letter

93.15–1 Posting.
93.15–5 Information contained in stability letter.

AUTHORITY: The provisions of this Part 93 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 3, 24 Stat. 129, as amended, 41 Stat. 305, as amended, sec. 2, 45 Stat. 1943, as amended, sec. 2, 49 Stat. 888, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 483, 363, 85a, 88a, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 93.01—Application

§ 93.01–1 General.

(a) The provisions of this part shall apply to the following vessels:

(1) All vessels contracted for on or after November 19, 1952, on an international voyage.

(2) Any other vessel whose stability is questioned by the Commandant or the Officer in Charge, Marine Inspection.

Subpart 93.05—Stability Test

§ 93.05–1 When required.

(a) Except as otherwise provided in this section, each vessel to which this part pertains shall be subjected to a stability test conducted under the supervision of the Coast Guard and the results of the test shall be approved before the vessel is placed in service.

(b) The Commandant may allow the stability test of a vessel to be dispensed with provided basic stability data are available from the stability test of a sister vessel and it is shown to the satisfaction of the Commandant that reliable stability information for the exempted vessel can be obtained from such basic data.

(c) The Commandant may also allow the stability test of an individual vessel or class of vessels, especially designed for the carriage of liquid or ore in bulk, to be dispensed with when reference to existing data for similar vessels clearly indicates that due to the vessel's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

§ 93.05–5 Procedure.

(a) *Stability tests.* Stability tests conducted on or after November 19, 1952, shall meet the requirements of this section.

(b) *Plans required.* (1) The following plans are essential for use in conducting the stability test and determining the results, and if these plans have not been previously submitted, they shall be made available at the time of the test:

Lines plan.
Curves of form, or hydrostatic curves.
General arrangement plan of decks, holds, inner bottoms, etc.
Inboard and outboard profile.
Midship section.
Capacity plan showing capacities and vertical and longitudinal centers of gravity of cargo spaces, tanks, etc.
Tank sounding tables.
Draft mark locations.

(c) *Stability test preparations.* (1) Preparations as noted in this paragraph shall be made to place a vessel in suitable condition for a stability test. The Coast Guard representative supervising the stability test may relax from these standards in a particular instance if, in his opinion, such relaxation is warranted and will not materially affect the reliability of the results of the test.

(2) To obtain dependable stability results, all tanks on the vessel, as far as practicable, shall be either completely empty and dry or fully pressed up and without air pockets. Where this is impracticable, slack tanks may be accepted provided their free surface can be readily and accurately determined for the angles of heel to be obtained during the stability test.

(3) The vessel shall be as nearly complete as practicable when the test is conducted. If additional material or equipment is to be installed after the test, a complete list of such items by weight and location shall be prepared.

(4) All dunnage, tools, and other items extraneous to the completed vessel shall be removed before the test.

(5) The vessel shall be moored in a location reasonably protected from broadside wind, waves, and tide. The depth of water shall be sufficient to provide ample clearance under the vessel against grounding. Mooring lines shall be arranged so that they will not interfere with the free rolling or listing of the vessel.

Subpart 93.10—Stability Information for Operating Personnel

§ 93.10–1 Information supplied to master.

(a) Based on the results of the stability test, information shall be prepared by the owners, approved by the Commandant, and furnished to the master which sets forth the stability data necessary to permit efficient handling of the vessel. In general, this information shall be such that the master can, for any condition of loading, by rapid and simple process, obtain accurate guidance as to the stability of the vessel and determine the freeboard.

(b) In the case of a vessel which due to its design or type of service, etc., requires special consideration of its stability characteristics, the information shall also include an indication of any operating conditions which must be maintained to assure the safety of the vessel.

(c) Where any alterations are made to a vessel so as to materially affect the stability information supplied to the

master, amended stability information shall be provided. If necessary the vessel shall have a new stability test.

Subpart 93.13—Ballast

§ 93.13–1 When needed.

(a) In view of the wide range of cargo weight and distribution placed in a cargo vessel, the use of ballast may be necessary in order to provide satisfactory immersion, trim and stability.

§ 93.13–5 Fixed ballast.

(a) When fixed ballast is installed, its amount and location shall be included in the stability information provided the vessel.

(b) Fixed ballast shall not be removed from the vessel or relocated unless first approved by the Commandant, except that such ballast may be temporarily moved for examination or repair of the vessel and then only under the supervision of a marine inspector.

§ 93.13–10 Liquid ballast.

(a) Liquid ballast may be used when necessary to provide satisfactory draft, trim, weight distribution, or stability.

(b) If it is necessary to put liquid ballast in oil tanks, the oily ballast shall not be discharged overboard within any of the prohibited zones as defined in the Oil Pollution Act, 1961 (33 U.S.C. 1011), except through oily water separators which meet the requirements in § 55.10–25(n) of Subchapter F (Marine Engineering) of this chapter, or directly into sludge barges or shore facilities, or other approved means.

(Sec. 8, 75 Stat. 404; 33 U.S.C. 1007. Treasury Department Order 167–46, Nov. 6, 1961, 26 F.R. 10609)

Subpart 93.15—Stability Letter

§ 93.15–1 Posting.

(a) Each vessel subject to the requirements of this part shall have posted under glass in the pilothouse a stability letter issued by the Coast Guard before the vessel is placed in service.

§ 93.15–5 Information contained in stability letter.

(a) Stability letters issued to vessels subject to the provisions of § 93.05–1(a) or (b) will record approval of the information required by Subpart 93.10 and will set forth the master's responsibility for maintaining satisfactory stability conditions at all times.

(b) Stability letters issued to vessels which are exempted from a stability test in accordance with § 93.05–1(c), will record this fact.

PART 94—LIFESAVING EQUIPMENT

Subpart 94.01—Application

Sec.
94.01–1 Details of application.

Subpart 94.05—General Provisions Pertaining to Lifesaving Equipment

94.05–1 Equipment of an approved type.
94.05–5 Equipment installed but not required.
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Subpart 94.10—Lifeboats, Liferafts, Lifefloats, Buoyant Apparatus, and Rescue Boats

Sec.
94.10–1 Application.
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94.10–10 Requirements for vessels in ocean or coastwise service other than barges; towing, fishing, and wrecking vessels; pilot boats; and yachts.
94.10–15 Requirements for seagoing barges in ocean or coastwise service.
94.10–20 Requirements for towing, fishing, and wrecking vessels, and pilot boats in ocean or coastwise service.
94.10–25 Requirements for yachts in ocean or coastwise service.
94.10–40 Requirements for vessels in Great Lakes, lakes, bays, and sounds; or river service other than fireboats, wrecking and fishing vessels, pilot boats, and yachts.
94.10–45 Requirements for fireboats, wrecking and fishing vessels, and pilot boats in Great Lakes; lakes, bays, and sounds; or river service.
94.10–50 Requirements for yachts in Great Lakes; lakes, bays, sounds; or river service.
94.10–55 Inflatable liferafts as an alternate for lifeboats, other liferafts, lifefloats and buoyant apparatus on certain vessels not on an international voyage.
94.10–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.15—Stowage and Marking of Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

94.15–1 Application.
94.15–5 General.
94.15–10 Stowage.
94.15–15 Marking.
94.15–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.20—Equipment for Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

94.20–1 Application.
94.20–5 General.
94.20–10 Required equipment for lifeboats.
94.20–15 Description of equipment for lifeboats.
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94.20–30 Required equipment for lifefloats and buoyant apparatus.
94.20–35 Description of equipment for lifefloats and buoyant apparatus.
94.20–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.25—Davits for Lifeboats

94.25–1 Application.
94.25–5 General.
94.25–10 Requirements for vessels in ocean or coastwise service.
94.25–15 Requirements for vessels in Great Lakes, lakes, bays, and sounds, or river service.
94.25–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.30—Lifeboat Winches

94.30–1 Application.
94.30–5 General.
94.30–10 Number and type required.
94.30–15 Installation.
94.30–90 Vessels contracted for prior to November 19, 1952.

Subpart 94.33—Blocks and Falls for Lifeboats

Sec.
94.33–1 Application.
94.33–5 General.
94.33–10 Installations where lifeboat winches are used.
94.33–15 Installations where lifeboat winches are not used.
94.33–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.35—Installation of Lifeboats, Davits and Winches

94.35–1 Application.
94.35–5 Tests and examinations.

Subpart 94.40—Life Preservers

94.40–1 Application.
94.40–5 General.
94.40–10 Number required.
94.40–15 Distribution and stowage.
94.40–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.43—Ring Life Buoys and Water Lights

94.43–1 Application.
94.43–5 General.
94.43–10 Number required.
94.43–15 Distribution and securing.
94.43–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.45—Line-Throwing Appliances

94.45–1 Application.
94.45–5 General.
94.45–10 Type required.
94.45–15 Equipment for line-throwing appliances.
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Subpart 94.50—Embarkation Aids

94.50–1 Application.
94.50–5 Ladders.
94.50–7 Embarkation aids into inflatable liferaft.
94.50–10 Illumination for lifeboat launching operations.
94.50–15 Illumination for liferaft stowage areas.
94.50–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.55—Portable Radio Apparatus

94.55–1 Required on international voyage.

Subpart 94.90—Ship's Distress Signals

94.90–1 Application.
94.90–5 Vessels in ocean or coastwise service.
94.90–10 Vessels in Great Lakes service.

AUTHORITY: The provisions of this Part 94 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 94.01—Application

§ 94.01–1 Details of application.

(a) Except as specifically noted, the provisions of this part shall apply to all vessels other than motorboats. Motorboats shall meet the requirements of Sub-

parts 94.01, 94.05, and 94.40, and § 94.10–1(c).

Subpart 94.05—General Provisions Pertaining to Lifesaving Equipment

§ 94.05–1 Equipment of an approved type.

(a) Where equipment in this part is required to be of an approved type, such equipment requires the specific approval of the Commandant. Such approvals are published in the FEDERAL REGISTER and in addition, are contained in Coast Guard publication CG–190, "Equipment Lists."

(b) Specifications for many of the items required to be of an approved type have been promulgated and are contained in Subchapter Q (Specifications) of this chapter. In general, such specifications are of interest only to the manufacturer of specific items of equipment.

§ 94.05–5 Equipment installed but not required.

(a) Where items of lifesaving equipment are not required, but are installed, such equipment and its installation shall meet the requirements of this part.

§ 94.05–10 Primary lifesaving equipment.

(a) The term "primary lifesaving equipment" means a lifeboat or an acceptable substitute. Life preservers and ring life buoys are not included in this definition of "primary lifesaving equipment."

Subpart 94.10—Lifeboats, Liferafts, Lifefloats, Buoyant Apparatus, and Rescue Boats

§ 94.10–1 Application.

(a) Except as otherwise provided in this section, the provisions of this subpart shall apply to all vessels other than motorboats, contracted for on or after May 26, 1965.

(b) Vessels other than motorboats, contracted for prior to May 26, 1965, shall meet the requirements of § 94.10–90.

(c) Inspected motorboats carrying freight for hire shall be provided with such number and size of approved liferafts, lifefloats, or buoyant apparatus as deemed necessary by the Officer in Charge, Marine Inspection. Workboats or skiffs may be permitted by the Officer in Charge, Marine Inspection, if considered suitable.

(d) In the case of special types of vessels subject to the International Convention for Safety of Life at Sea, 1960, which are not specifically treated in this subpart, such as whale factory ships, fish processing and canning ships, etc., the Commandant may give special consideration as to lifesaving equipment requirements to the extent permitted by the International Convention for Safety of Life at Sea, 1960.

§ 94.10–5 Type of lifeboats, liferafts, lifefloats, buoyant apparatus, and rescue boats required.

(a) *Lifeboats.* (1) All lifeboats shall be of an approved type, constructed in accordance with Subpart 160.035 of Subchapter Q (Specifications) of this chapter except as specifically noted in this part.

(2) All lifeboats certified to carry 60 or more but not over 100 persons shall be either motor lifeboats or shall be fitted with an approved type of hand-propelling gear. Lifeboats carrying more than 100 persons shall be motor lifeboats.

(3) A Class 1 motor lifeboat is one that is fitted with a compression-ignition engine, is capable of being readily started in all conditions, and has sufficient fuel for 24 hours continuous operation. The speed ahead in smooth water when loaded with its full complement of persons and equipment shall be at least 6 knots.

(4) Except as further modified in this subparagraph, all lifeboats, except those installed on vessels in river service, shall be fitted with suitable disengaging apparatus consisting of fixed hooks in the lifeboat or mechanical disengaging apparatus. Mechanical disengaging apparatus, if fitted shall be of an approved type, constructed in accordance with Subpart 160.033 of Subchapter Q (Specifications) of this chapter.

(i) All lifeboats installed on ocean, coastwise, or Great Lakes vessels of over 3,000 gross tons shall be fitted with mechanical disengaging apparatus so arranged as to make it possible for the lifeboats to be launched with their full complement of persons and equipment while such vessels are underway or stopped, and for both ends of the lifeboat to be released simultaneously, under tension or not, by one person. Simultaneous release shall be effected by partially rotating a shaft which shall be continuous and extend from points of contact with the hooks.

(ii) All lifeboats installed on any particular vessel shall be fitted with the same type of disengaging apparatus.

(iii) On small vessels, the Commandant may approve means other than those previously mentioned to agree with the needs of a particular vessel.

(b) *Liferafts.* (1) All rigid type liferafts shall be of an approved type, constructed in accordance with Subpart 160.018 of Subchapter Q (Specifications) of this chapter. Type A liferafts shall be stowed on the standard liferaft skids required by § 94.15–10(c)(1) unless specifically noted otherwise. Rigid type liferafts shall not be used as required equipment on vessels on an international voyage.

(2) All inflatable liferafts shall be of an approved type constructed in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

(3) On vessels on an international voyage, each inflatable liferaft shall have a carrying capacity of not less than 6 nor more than 25 persons.

(c) *Lifefloats.* (1) All lifefloats shall be of an approved type, constructed in accordance with Subpart 160.027 of Subchapter Q (Specifications) of this chapter.

(d) *Buoyant apparatus.* (1) All buoyant apparatus shall be of an approved type, constructed in accordance with Subpart 160.010 of Subchapter Q (Specifications) of this chapter.

(e) *Rescue boat.* (1) In general, a suitable rescue boat shall be a small lightweight boat of rigid construction, with built-in buoyancy and capable of being readily launched and easily maneuvered. Also it shall be of adequate proportion to permit taking an unconscious person on board without capsizing. A rescue boat and its installation shall be acceptable to the Officer in Charge, Marine Inspection, as suitable for the rescue of persons accidentally falling over the side, or for similar emergency purposes. The size, shape, installation, and other factors of suitability will be determined with due consideration of the size, arrangement, intended service, and crew requirements of the vessel on which it is to be installed.

§ 94.10–10 Requirements for vessels in ocean or coastwise service other than barges; towing, fishing, and wrecking vessels; pilot boats; and yachts.

(a) All vessels shall be provided with sufficient lifeboats on each side of the vessel to accommodate all persons on board.

(b) Lifeboats shall be not less than 24 feet in length, except where owing to the size of the vessel, or for other reasons, the Commandant considers the carriage of such lifeboats to be unreasonable or impracticable. However, in no case shall lifeboats of less than 16 feet in length be used.

(c) All vessels of 1,600 gross tons and over on an international voyage shall carry at least one motor-propelled lifeboat of Class 1.

(d) In addition to the lifeboats required by paragraph (a) of this section, all vessels on an international voyage and all vessels in ocean service shall be provided with liferafts of such aggregate capacity to accommodate at least one-half the total number of persons on board. Those vessels having widely spaced accommodations and/or working spaces shall have at least one liferaft in each such location.

(e) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with § 94.10–55.

§ 94.10–15 Requirements for seagoing barges in ocean or coastwise service.

(a) All manned seagoing barges of 100 gross tons and over shall be provided with a lifeboat of sufficient capacity for all persons on board. All lifeboats shall have a capacity of at least 80 cubic feet.

(b) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with § 94.10–55.

§ 94.10–20 Requirements for towing, fishing, and wrecking vessels, and pilot boats in ocean or coastwise service.

(a) All vessels of 500 gross tons and over on an international voyage, other than fishing vessels, shall meet the applicable requirements of § 94.10–10 in lieu of the requirements of this section.

(b) All vessels shall carry sufficient lifeboats or flotation equipment for all

persons on board. In lieu of the standard lifeboats required by § 94.10–5 (a), the following types of boats or flotation equipment may be used by the vessels specified:

(1) Vessels engaged exclusively in the business of purse seining may use their seine boats.

(2) Vessels engaged exclusively in the business of hook and line fishing from dories may use their dories provided they are fitted with air tanks of sufficient capacity to meet the requirements of Subpart 160.035 of Subchapter Q (Specifications) of this chapter for lifeboats.

(3) Vessels engaged exclusively in the business of wrecking may use their surf boats.

(4) Vessels engaged exclusively in the business of furnishing pilots to vessels may use their launches and/or yawls.

(5) Vessels not exceeding 150 feet in length which are under 300 gross tons engaged exclusively in the business of transporting supplies, equipment, and cargo to or from operational sites of exploration, development, removal and storage of resources or related activities thereof on the continental shelf of the United States in the Gulf of Mexico, in the Atlantic Ocean south of the thirty-third parallel north latitude and in the Pacific Ocean may use lifefloats in lieu of lifeboats if a suitable emergency boat is carried and is adequately installed. Vessels in this category may carry persons in addition to the crew up to the number specified in the certificate of inspection, but not to exceed 16, and such persons may be only industry personnel engaged exclusively in the exploration, development, removal and storage of resources, or related activities thereof, who are required by the nature of their work to ride such vessels.

(c) All lifeboats shall have a capacity of at least 180 cubic feet. However, the Coast Guard District Commander may, in exceptional cases, permit smaller lifeboats where the crew is insufficient to handle the larger lifeboat or where there is lack of space to carry such larger lifeboat. In no case may lifeboats be used having a capacity of less than 125 cubic feet.

(d) Inflatable liferafts may be substituted for lifeboats, liferafts, lifefloats and buoyant apparatus on certain vessels in accordance with § 94.10–55.

§ 94.10–25 Requirements for yachts in ocean or coastwise service.

(a) All yachts in ocean service shall have an aggregate lifeboat and liferaft capacity for all persons on board. Not less than 75 percent of the required capacity shall be in lifeboats and the remainder may be in Type A or Type B liferafts.

(b) All yachts in coastwise service shall have an aggregate lifeboat and liferaft capacity as required in paragraph (a) of this section, except that during the interval between May 15 and October 15 in any one year, both dates inclusive, they shall only be required to be equipped with lifeboat and liferaft capacity to accommodate 70 percent of all persons on board, not less than 50 percent of the required capacity shall be in lifeboats and the remainder may be in Type A or Type B liferafts.

(c) All lifeboats shall have a capacity of at least 125 cubic feet. However, the Coast Guard District Commander may, if he deems it proper, modify the requirements as to the size of lifeboats.

(d) Yachts may use their launches in lieu of the standard lifeboats required by § 94.10–5 (a), provided the launches are equipped with air tanks of sufficient capacity to meet the requirements of Subpart 160.035 of Subchapter Q (Specifications) of this chapter for lifeboats. Such launches shall be fitted with suitable nameboards or the name of the vessel shall be painted on the bow or stern.

(e) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

§ 94.10–40 Requirements for vessels in Great Lakes; lakes, bays, and sounds; or river service other than fireboats, wrecking and fishing vessels, pilot boats, and yachts.

(a) All vessels, except those on an international voyage, shall be provided with lifeboats and liferafts as required by Table 94.10–40(a).

(b) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

(c) All vessels on an international voyage shall meet the applicable requirements of § 94.10–10.

TABLE 94.10–40 (a)—LIFEBOATS AND LIFERAFTS REQUIRED ON VESSELS IN GREAT LAKES; LAKES, BAYS, AND SOUNDS AND RIVER SERVICE OTHER THAN FIREBOATS, WRECKING AND FISHING VESSELS, PILOT BOATS, AND YACHTS

	Great Lakes			Lakes, bays, and sounds		Rivers	
		Other vessels					
	Vessels carrying cargo	50 gross tons and over	Under 50 gross tons	50 gross tons and over	Under 50 gross tons	50 gross tons and over	Under 50 gross tons
Percentage of persons to be accommodated.	100	100	100	100	100	At least one suitable boat with lines attached and supplied with oars.[3]	Only lifeboats or liferafts as in the judgment of Officer in Charge, Marine Inspection, are necessary.
Percentage of required equipment in lifeboats.	[1] 100	[1] [2] 50	Either lifeboats or liferafts.	[2] 50	Either lifeboats or liferafts.	do	Do.
Percentage of required equipment which may be in Type A or Type B liferafts.	None	50	do	50	do	do	Do.

[1] When of 300 gross tons and over, vessels carrying cargo having berthing and/or working spaces forward widely separated from messing or recreational spaces aft shall have, in addition to all other lifeboats and liferafts required, two fully equipped approved liferafts of not less than 15-person capacity. These liferafts shall be stowed (not necessarily in skids) so as to float clear in the event of sinking of the vessel. One shall be located forward and the other aft. An approved lifefloat of not less than 15-person capacity may be substituted for the required liferaft aft. When of 300 gross tons and over, vessels carrying cargo (not having berthing and/or working spaces forward widely separated from messing or recreational spaces aft) and towing vessels are required to have only one approved liferaft or lifefloat of not less than 15-person capacity as additional lifesaving equipment.

[2] Harbor towing vessels of less than 150 gross tons may substitute one or more liferafts of Type A or Type B for the lifeboats required if the lifeboats interfere with the practical operation of the vessel and the substitution may be made with safety in the opinion of the Officer in Charge, Marine Inspection.

[3] Vessels navigating waters where the average depth of the channel does not exceed 3 feet shall not be required to be equipped with boats.

§ 94.10–45 Requirements for fireboats, wrecking and fishing vessels, and pilot boats in Great Lakes; lakes, bays, and sounds; or river service.

(a) All vessels of 50 gross tons and over shall have an aggregate lifeboat and liferaft capacity to accommodate all persons on board. Not less than 50 percent of such capacity shall be in lifeboats and the remainder may be in Type A or Type B liferafts.

(b) All vessels of less than 50 gross tons shall have an aggregate lifeboat and liferaft capacity to accommodate all persons on board. The liferafts may be either Type A or Type B.

(c) In lieu of the standard lifeboats required by § 94.10–5 (a) the following types of boats may be used:

(1) Vessels used exclusively as fireboats and connected to or belonging to a regularly organized fire department shall be required to carry only such boats or rafts as in the judgment of the Officer in Charge, Marine Inspection, may be required to carry the crew.

(2) Vessels engaged exclusively in the business of furnishing pilots to vessels may use their launches and/or yawls.

(3) Vessels engaged exclusively in the business of wrecking may use their surf boats.

(4) Vessels engaged exclusively in the business of seine fishing may use their seine boats.

(d) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

§ 94.10–50 Requirements for yachts in Great Lakes; lakes, bays, and sounds; or river service.

(a) All yachts shall be fitted with lifeboats and liferafts as required by Table 94.10–40(a), depending upon the service. Alternatively, such equipment may be provided as required by Table 75.10–20

(a) of Subchapter H (Passenger Vessels) of this chapter.

(b) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

§ 94.10–55 Inflatable liferafts as an alternate for lifeboats, other liferafts, lifefloats and buoyant apparatus on certain vessels not on an international voyage.

(a) (1) On all vessels inflatable liferafts may be permitted as substitutes for other types of liferafts, lifefloats and buoyant apparatus wherever they may be required.

(2) The capacity of inflatable liferafts carried in place of other liferafts, lifefloats, and buoyant apparatus shall be at least equivalent to that required of the equipment for which substitution is made.

(3) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

(b) On all vessels less than 3,000 gross tons the substitution of liferafts for lifeboats may be permitted as follows:

(1) (i) On all vessels under 500 gross tons, inflatable liferafts may be substituted for all required lifeboats.

(ii) The total capacity of the inflatable liferafts shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate. Partial substitution is permissible provided the aggregate lifeboat and inflatable liferaft capacity is sufficient to accommodate the required number of persons, as indicated above.

(iii) Where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(iv) In the exceptional case on a vessel under 100 gross tons, the rescue boat may be omitted when it can be shown to the satisfaction of the Commandant that it is not necessary due to the size, arrangement and maneuverability of the vessel, and its intended service.

(2) (i) On all vessels of 500 gross tons and upward to 1,600 gross tons, inflatable liferafts may be substituted for all required lifeboats provided one approved lifeboat of a size acceptable to the Officer in Charge, Marine Inspection, suitable for rescue purposes, is installed.

(ii) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate.

(iii) The launching arrangement and location of the lifeboat to be used as rescue boat shall be such that it can be readily launched and shall be to the satisfaction of the Officer in Charge, Marine Inspection.

(3) (i) On all vessels of 1,600 gross tons and upward to 3,000 gross tons, inflatable liferafts may be substituted for all except two of the required lifeboats. These lifeboats shall be of a size acceptable to the Officer in Charge, Marine Inspection, and shall be suitable for rescue purposes. In all cases, two approved lifeboats, one on each side, shall be provided.

(ii) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats, for which substitutions are made plus those remaining on board, would have been required to accommodate.

(4) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

(c) On all seagoing barges of 100 gross tons and over an inflatable liferaft may be substituted for the required lifeboat, the total capacity of which shall be sufficient to accommodate all persons on board.

(1) On seagoing barges employed as drilling tenders in the offshore oil exploration industry where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(d) The Commandant may give special consideration to the substitution of approved inflatable liferafts for required lifeboats on vessels of 3,000 gross tons and over.

§ 94.10–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.10–5 through 94.10–55 shall be complied with insofar as the number and general type of lifesaving equipment is concerned. Existing items of lifesaving equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.10–5 through 94.10–55 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable specifications or requirements.

(2) On vessels of over 3,000 gross tons certificated for ocean, coastwise, or Great Lakes service, all replacement of disengaging apparatus shall meet the requirements of § 94.10–5(a) (4) (i). On all other vessels certificated for any service, all of the lifeboats on a particular vessel shall be fitted with the same type of disengaging apparatus.

(3) The requirements of § 94.10–10(c) shall not apply except for replacements, and then only if it can be done without change to existing davits and arrangements.

Subpart 94.15—Stowage and Marking of Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 94.15–1 Application.

(a) The provisions of this subpart, with the exception of § 94.15–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.15–90.

§ 94.15–5 General.

(a) The lifeboats, liferafts, lifefloats, and buoyant apparatus shall be readily available in the case of emergency, and shall be kept in good working order and available for immediate use at all times when the vessel is being navigated and, insofar as reasonable and practicable, while the vessel is not being navigated.

(b) The decks on which lifeboats, liferafts, lifefloats, and buoyant apparatus are carried shall be kept clear of freight or any other obstructions which would interfere with the immediate launching of the lifesaving appliances.

§ 94.15–10 Stowage.

(a) *General.* Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be stowed in such a manner that:

(1) They are capable of being launched in the shortest possible time.

(2) They shall not impede the launching or handling of other lifesaving appliances.

(3) They shall not impede the marshalling of persons at the embarkation stations, or their embarkation.

(4) They shall be capable of being put in the water safely and rapidly even under unfavorable conditions of list and trim.

(b) *Lifeboat stowage.* (1) Every lifeboat shall be attached to a separate set of davits.

(2) Suitable access to the lifeboats shall be provided to enable the crew to prepare the lifeboats for launching.

(3) Lifeboats shall be so stowed that embarkation into them may be made rapidly and in good order.

(4) Lifeboats shall not be stowed in the bows of the vessel nor as far aft as to be endangered by the propellers or overhang of the stern.

(5) Lifeboats shall be so stowed that it shall not be necessary to lift them in order to swing out the davits, except on small vessels where such requirement is unreasonable and impracticable in the opinion of the Officer in Charge, Marine Inspection.

(6) Means shall be provided for bringing the lifeboats against the ship's side and holding them there so that persons may be safely embarked.

(7) On vessels certificated for ocean or coastwise service, lifeboats shall be fitted with skates or other suitable means to facilitate launching against an adverse list of up to 15 degrees. However, skates may be dispensed with if, in the opinion of the Commandant, the arrangements are such as to insure that the lifeboats can be satisfactorily launched without such skates.

(8) On vessels in ocean and coastwise service, where applicable, means shall be provided outside the machinery space to prevent the discharge of water into the lifeboats while they are being lowered. This shall consist of baffles to deflect the water down the vessel's side, or reach rods, or other means to close the discharge openings.

(c) *Liferaft stowage.* (1) Type A liferafts shall be stowed on standard skids constructed in accordance with Subpart 160.042 of Subchapter Q (Specifications) of this chapter.

(2) Type B liferafts shall be stowed in such a manner that they may be readily launched.

(3) The additional liferaft required on Great Lakes vessels by Table 94.10–40 (a) shall be stowed in such a manner that it will float clear in the event of sinking of the vessel. The requirements of subparagraphs (1) and (2) of this paragraph need not be complied with for such liferaft.

(4) Inflatable liferafts shall be stowed in such a manner that they will float free in the event of the vessel sinking. Stowage and launching arrangements will be to the satisfaction of the Officer in Charge, Marine Inspection.

(d) *Lifefloat and buoyant apparatus stowage.* (1) Lifefloats and buoyant apparatus shall be stowed in such a manner as to be readily launched. Lifefloats exceeding 400 pounds in weight shall be stowed in such a manner as not to require lifting before launching.

(2) Lifefloats and buoyant apparatus shall not be secured to the vessel except by lashings which can be easily slipped. They may be stowed in tiers one above the other, but not more than four high. When stowed in tiers, the separate units shall be kept apart by suitable distance pieces.

(3) Means shall be provided to prevent shifting.

§ 94.15–15 Marking.

(a) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be marked as required by §§ 97.37–37 and 97.37–40 of this subchapter.

§ 94.15–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) The provisions of §§ 94.15–5 through 94.15–15 shall be met except as further set forth in this paragraph.

(2) The requirements of § 94.15–10(b) (7) shall apply unless in the opinion of the Officer in Charge, Marine Inspection, it is unreasonable or impracticable, or the arrangement or construction of the vessel make the use of skates or similar appliances unnecessary.

Subpart 94.20—Equipment for Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 94.20–1 Application.

(a) The provisions of this subpart, with the exception of § 94.20–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.20–90.

§ 94.20–5 General.

(a) Equipment for lifeboats, liferafts, lifefloats, and buoyant apparatus shall be of good quality, efficient for the purpose they are intended to serve, and kept in good condition.

(b) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be fully equipped before the vessel is navigated and the equipment shall remain in such lifesaving appliances throughout the voyage, except as provided in § 97.15–45 (e) of this subchapter.

(c) It shall be unlawful to stow in any lifeboat, liferaft, lifefloat, or buoyant apparatus any article not required by this subpart unless such article can be properly stowed so as not to reduce the seating capacity or space available to the occupants and so as not to adversely affect the seaworthiness of such appliances or, in the case of lifeboats, overload the davits or winches.

(d) Loose equipment, except boathooks in lifeboats, shall be securely attached to the lifesaving appliance to which it belongs.

§ 94.20–10 Required equipment for lifeboats.

(a) The lifeboats for all vessels shall be equipped in accordance with Table 94.20–10(a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 94.20–15. The letter identification prefixing the item in the table corresponds to the paragraph designations in § 94.20–15.

TABLE 94.20–10(a)

Letter identification	Item	Ocean and coastwise		Great Lakes		Lakes, bays and sounds; and rivers
		Other than seagoing barges	Seagoing barges	Vessels carrying cargo	Other	
a	Bailer	1	None	1	None	None
b	Bilge pump	[1] 1	None	None	None	None
c	Boathooks	[2] 2	2	1	1	1
d	Bucket	2	1	1	1	1
e	Compass and mounting	1	None	None	None	None
f	Ditty bag	1	None	None	None	None
g	Drinking cups	1	1	None	None	None
h	Fire extinguishers (motor-propelled lifeboats only).	2	2	2	2	2
i	First-aid kit	1	None	None	None	None
j	Flashlight	1	None	1	None	None
k	Hatchets	2	None	2	1	1
l	Heaving line	2	None	None	None	None
m	Jackknife	1	1	None	None	None
n	Ladder, lifeboat, gunwale	1	None	None	None	None
o	Lantern	1	1	1	1	1
p	Lifeline	1	1	1	1	1
q	Life preservers	2	2	2	2	2
r	Locker	1	None	1	None	None
s	Mast and sail (oar-propelled lifeboats only)	1	None	None	None	None
t	Matches (boxes)	2	2	1	1	1
u	Milk, condensed (pounds per person)	1	None	None	None	None
v	Mirrors, signaling	2	None	None	None	None
w	Oars	[3] 1 unit	[3] 1 unit	[3] 1 unit	[3] 1 unit	[3] 1 unit
x	Oil, illuminating (quarts)	1	None	1	None	None
y	Oil, storm (gallons)	1	None	1	None	None
z	Painter	2	1	2	1	1
aa	Plugs	1	1	1	1	1
bb	Provisions (pounds per person)	2	None	None	None	None
cc	Rowlocks	[3] 1 unit	[3] 1 unit	[3] 1 unit	[3] 1 unit	[3] 1 unit
dd	Rudder and tiller	1	1	1	1	None
ee	Sea anchor	1	None	1	None	None
ff	Signals, distress, floating orange smoke	2	None	None	None	None
gg	Signals, distress, red hand flare	[3] 1 unit	None	[3] ½ unit	None	None
hh	Signals, distress, red parachute flare	[3] 1 unit	None	[3] ½ unit	None	None
ii	Tool kit (motor-propelled lifeboat only)	[3] 1 unit	[3] 1 unit	[3] 1 unit	[3] 1 unit	[3] 1 unit
jj	Water (quarts per person)	3	1	None	None	None
kk	Whistle, signaling	1	None	None	None	None
ll	Fishing kit	1	None	None	None	None
mm	Cover, protecting	1	None	None	None	None
nn	Signals, lifesaving	1	None	None	None	None
oo	Desalting kit	[4] 1	None	None	None	None

[1] Motor-propelled lifeboats, certified for 100 or more persons, shall be fitted with an additional hand bilge pump of an approved type or a power bilge pump.
[2] For description of units, see § 94.20–15.
[3] Vessels in coastwise service need only carry 1 unit for each 5 lifeboats or fraction thereof.
[4] Optional equipment. See § 94.20–15(jj) water.

§ 94.20–15 Description of equipment for lifeboats.

(a) *Bailer.* The bailer shall have a lanyard attached and shall be of sufficient size and suitable for bailing.

(b) *Bilge pump.* Bilge pumps shall be of an approved type, constructed in accordance with Subpart 160.044 of Subchapter Q (Specifications) of this chapter. They shall be of the size given in Table 94.20–15 (b) depending upon the capacity of the lifeboat as determined by the six-tenths rule as described in § 160.035–8 (b) of Subchapter Q (Specifications) of this chapter.

TABLE 94.20–15 (b)

Capacity of lifeboat, cubic feet		Bilge pump size
Over	Not over	
----	330	1
330	700	2
700	----	3

(c) *Boathooks.* Boathooks shall be of the single hook ball-point type. Boathook handles shall be of clear grained white ash, or equivalent, and of a length

and diameter as given in Table 94.20–15 (c).

TABLE 94.20–15 (c)

Length of lifeboat, feet		Boathook handles	
Over	Not over	Diameter, inches	Length, feet
----------	23	1½	8
23	29	1¾	10
29	----------	2	12

(d) *Bucket.* The bucket shall be of heavy gage galvanized iron, or other suitable corrosion-resistant metal, of not less than 2-gallon capacity, and shall have a 6-foot lanyard of 12-thread manila attached.

(e) *Compass and mounting.* The compass and mounting shall be of an approved type constructed in accordance with U. S. Coast Guard specification dated December 14, 1944.

(f) *Ditty bag.* The ditty bag shall consist of a canvas bag and shall contain a sailmaker's palm, needles, sail twine, marline, and marline spike.

(g) *Drinking cups.* Drinking cups shall be enamel coated or plastic, graduated in ounces, and be provided with lanyards 3 feet in length.

(h) *Fire extinguisher.* Fire extinguishers shall be of approved Type B–C, Size I (see § 95.50–5 of this subchapter). One shall be attached to each end of the lifeboat.

(i) *First-aid kit.* The first-aid kit shall be of an approved type, constructed and fitted in accordance with Subpart 160.041 of Subchapter Q (Specifications) of this chapter.

(j) *Flashlight.* The flashlight shall be of an approved Type I, Size No. 3, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter. Three spare cells (or one 3-cell battery) and two spare bulbs, stowed in a watertight container, shall be provided with each flashlight. Batteries shall be replaced yearly during the annual stripping, cleaning, and overhaul of the lifeboat.

(k) *Hatchet.* Hatchets shall be of an approved type, constructed in accordance with Subpart 160.013 of Subchapter Q (Specifications) of this chapter. They shall be attached to the lifeboat by individual lanyards and be readily available for use, one at each end of the lifeboat.

(l) *Heaving line.* The heaving line shall be of adequate strength, 10 fathoms in length, and 1 inch in circumference. It shall be of such quality as to be buoyant after 24 hours' submergence.

(m) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(n) *Ladder, lifeboat gunwale.* The lifeboat gunwale ladder shall consist of 3 flat wood steps cut out for hand holds. The steps shall be spaced 12 inches apart and fastened with ⅝ inch diameter manila rope. Each rope end shall be tied inside the lifeboat at about amidships with the ladder stowed on top of the side benches and ready for immediate use. Other suitable devices may be specifically approved.

(o) *Lantern.* The lantern shall contain sufficient oil to burn for at least 9 hours, and shall be ready for immediate use.

(p) *Lifeline.* The lifeline shall be properly secured to both sides of the lifeboat along its entire length, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila. The bights shall hang to within 12 inches of the water when the lifeboat is light.

(q) *Life preservers.* Life preservers shall be of an approved type, constructed in accordance with the applicable subparts of Subchapter Q (Specifications) of this chapter.

(r) *Locker.* The locker shall be suitable for the storage and preservation of the small items of equipment.

(s) *Mast and sail.* A unit, consisting of a standing lug sail together with the necessary spars and rigging, shall be provided in general agreement with Table 94.20–15 (s). The sails shall be of good quality canvas, colored Indian Orange (Cable No. 70072, Standard Color Card of America). Rigging shall consist of galvanized wire rope not less than 5/16 inch in diameter. The mast and sail shall be protected by a suitable canvas cover.

TABLE 94.20–15 (s)

Length of lifeboat, feet		Standing lug sail								Mast [1]		Yard [1]	
Over	Not over	Area, square feet	Luff and head lengths		Leach length		Foot length		Clew to throat		Ounces per square yard	Commercial designation No.	Length	Diameter, inches	Length	Diameter, inches
			Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.			Ft. In.		Ft. In.	
----	17	58	8	11	12	1	8	10	10	10	14.35	10	11 2	3	6 11	2
17	19	74	9	8	13	8	10	0	12	2	14.35	10	12 6	3	7 8	2
19	21	93	7	5	15	1	11	2	13	8	14.35	10	13 10	3½	8 5	2½
21	23	113	8	3	16	11	12	4	14	1	14.35	10	14 11	3½	9 3	2½
23	25	135	9	0	18	8	13	6	15	6	14.35	10	16 6	4	10 0	3
25	27	158	9	9	20	0	14	7	17	10	17.50	8	17 10	4	10 9	3
27	29	181	10	5	21	5	15	7	19	1	17.50	8	19 2	4½	11 5	3½
29	31	203	11	0	22	8	16	8	20	5	20.74	6	20 8	4½	12 0	3½
31		[2]	[2]		[2]		[2]		[2]		[2]	[2]	[2]		[2]	

[1] Mast lengths measured from heel to center of upper halyard sheave. Mast diameters measured at thwart. Mast and yard shall be of clear-grained spruce, fir, or equivalent.
[2] Subject to special consideration.

(t) *Matches.* A box of friction matches in a watertight container stowed in an equipment locker or secured to the underside of the stern thwart if no locker is fitted.

(u) *Milk, condensed.* One pound of condensed milk shall be provided for each person the lifeboat is certified to carry, to be stowed in lockers or other compartments providing suitable protection.

(v) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(w) *Oars.* A unit, consisting of a complement of rowing oars and steering oar, shall be provided for each lifeboat in accordance with Table 94.20–15(w), except that motor-propelled and hand-propelled lifeboats need only be equipped with four rowing oars and one steering oar. In any case, the emergency lifeboats shall be provided with the full complement of oars prescribed by the table. All oars shall be buoyant.

TABLE 94.20–15 (w)

Length of lifeboat, feet		Number of oars		Length of oars, feet	
Over	Not over	Rowing	Steering	Rowing	Steering
-----	15	4	1	8	9
15	19	6	1	10	11
19	21	6	1	11	12
21	23	6	1	12	13
23	25	6	1	13	14
25	27	6	1	14	15
27	----	6	1	15	16

(x) *Oil, illuminating.* One quart of illuminating oil shall be provided in a metal container.

(y) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(z) *Painter.* Painters shall be of manila rope not less than 2¾ inches in circumference, or equivalent, and of a length not less than 3 times the distance between the deck on which the lifeboat is stowed and the light draft of the vessel. For lifeboats in vessels on ocean, coastwise or Great Lakes service one of the painters shall have a long eye splice and be attached to the thwart with a toggle. The other painter shall be attached to the stem.

(aa) *Plug.* The automatic drain required in the lifeboat shall be provided with a cap or plug attached to the lifeboat by a suitable chain.

(bb) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the lifeboat is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in lockers or other compartments providing suitable protection.

(cc) *Rowlocks.* A unit, consisting of sufficient rowlocks and rowlock sockets for each oar required by Table 94.20–15

(w) plus 2 additional rowlocks. The rowlocks shall be attached to the lifeboat by separate chains so as to be available for immediate use, except that the 2 additional spare rowlocks shall be carried in the equipment locker or stowed near the stern if no locker is fitted. The rowlocks and rowlock sockets shall be distributed so as to provide the maximum amount of single banked oars practicable.

(dd) *Rudder and tiller.* The rudder and tiller shall be constructed in accordance with § 160.035–3 (t) of Subchapter Q (Specifications) of this chapter.

(ee) *Sea anchor.* The sea anchor shall be of an approved type.

(ff) *Signals, distress, floating orange smoke.* Two approved floating orange smoke distress signals, constructed in accordance with Subpart 160.022 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(gg) *Signals, distress, red hand flare.* A unit, consisting of twelve approved hand red flare distress signals in a watertight container, constructed in accordance with Subpart 160.021 or Subpart 160.023 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(hh) *Signals, distress, red parachute flare.* A unit, consisting of twelve parachute red flare distress signals with an approved means of projecting them, all contained in a portable watertight container; or twelve approved hand-held rocket-propelled parachute red flare distress signals contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or Subpart 160.036 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(ii) *Tool kit.* The tool kit shall consist of at least the following tools contained in a suitable container:

(1) One 12-ounce ball peen hammer.
(2) One screwdriver with 6-inch blade.
(3) One pair 8-inch slip joint pliers.
(4) One 8-inch adjustable end wrench.

(jj) *Water.* (1) For each person the lifeboat is certified to carry, there shall be provided 3 quarts of drinking water consisting of nine approved hermetically sealed containers per person, constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to 5 years from date of packing, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration. Approved desalting kits capable of producing an equal amount of drinking water may be substituted for not more than one third of the drinking water required to be carried.

(2) The drinking water containers shall be stowed in drinking water tanks, lockers, or other compartments providing suitable protection.

(kk) *Whistle, signaling.* The whistle shall be of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order.

(ll) *Fishing kit.* The fishing kit shall be of an approved type constructed in accordance with Subpart 160.061 of Subchapter Q (Specifications) of this chapter.

(mm) *Cover, protecting.* The protecting cover shall be of a highly visible color, and capable of protecting the occupants against injury by exposure.

(nn) *Table of lifesaving signals.* The table shall be in accordance with the provisions of Chapter V, Regulation 16, of the International Convention for Safety of Life at Sea, 1960, and shall be printed on water resistant paper.

(oo) *Desalting kit.* One or more approved desalting kits may be used as a substitute for one third of the required amount of drinking water per person, and shall be constructed in accordance with Subpart 160.058 of Subchapter Q (Specifications) of this chapter.

§ 94.20–20 Required equipment for liferafts.

(a) The liferafts for all vessels shall be equipped in accordance with Table 94.20–20(a). For a description of the items contained in this table and the units comprising the items, see the applicable paragraphs of § 94.20–25. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 94.20–25.

TABLE 94.20–20(a)

Letter identification	Item identification	Ocean and coastwise	Great Lakes		Lakes, bays, and sounds; and rivers
			Vessels carrying cargo	Other vessels	
a	Boathook	1	1	1	1
b	Drinking cups	1	None	None	None
c	Jackknife	1	None	None	None
d	Lifeline	[1] 1	[1] 1	[1] 1	[1] 1
e	Matches (boxes)	1	1	None	None
f	Mirrors, signaling	2	None	None	None
g	Oars	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
h	Oil, storm (gallons)	1	1	None	None
i	Painter	1	1	1	1
j	Provisions (pounds per person)	2	None	None	None
k	Rowlocks	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
l	Sea anchor	1	1	None	None
m	Signals, distress	[2] 1 unit	[2] 1 unit	None	None
n	Water (quarts per person)	1	None	None	None
o	Water light	1	1	[4] 1	None

[1] Not required on Type A liferafts.
[2] For description of units see § 94.20–25.
[3] 1 unit here means 6 hand red flare distress signals and 6 parachute red flare distress signals with an approved means of projecting them.
[4] Required only on towing vessels of 300 gross tons and over.

(b) Inflatable liferafts shall be equipped with ocean service equipment for vessels on ocean and coastwise routes and with limited service equipment for vessels on Great Lakes, lakes, bays, sounds, and river routes in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

NOTE: Subpart 160.051 of Subchapter Q (Specifications) of this chapter requires the servicing of inflatable liferafts at approved servicing facilities. Included in the servicing at an approved servicing facility is a complete inspection of the required equipment by a marine inspector.

§ 94.20–25 Description of equipment for liferafts.

(a) *Boathooks.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 8 feet long and 1½ inches in diameter.

(b) *Drinking cups.* Drinking cups shall be enameled and provided with ⅛-inch cotton lanyards 3 feet in length.

(c) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(d) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the liferaft, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(e) *Matches.* A box of friction matches in a watertight container.

(f) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(g) *Oars.* A unit, consisting of 4 rowing oars and one steering oar not less than 8 feet in length shall be provided for life rafts for 7 persons or more. For life rafts for 6 persons or less, a unit shall consist of 2 paddles not less than 5 feet in length.

(h) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(i) *Painter.* Painters shall be of manila rope not less than 2¾ inches in

circumference and of a length not less than 3 times the distance between the deck on which the liferafts are stowed and the light draft of the vessel.

(j) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the life raft is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in compartments providing suitable protection.

(k) *Rowlocks.* A unit consisting of 5 rowlocks attached to the liferaft by separate chains and ready for immediate use, together with proper rowlock sockets so arranged as to provide 4 rowing positions and one steering position with the liferaft floating either side up. Rowlocks and rowlock sockets are not required on life rafts for 6 persons or less.

(l) *Sea anchor.* The sea anchor shall be constructed of good quality canvas or other satisfactory material, and shall be not less than 2 feet in diameter.

(m) *Signals, distress.* A unit, consisting of equipment as specified in subparagraphs (1) to (3) of this paragraph. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(1) Twelve approved hand red flare distress signals in a watertight container and two approved floating orange smoke distress signals, constructed in accordance with Subparts 160.021 and 160.022 of Subchapter Q (Specifications) of this chapter, or

(2) Twelve approved hand red flare distress signals in a watertight container and 12 approved hand orange smoke distress signals, constructed in accordance with Subparts 160.021 and 160.037 of Subchapter Q (Specifications) of this chapter, or

(3) Twelve approved hand combination flare and smoke distress signals, constructed in accordance with Subpart 160.023 of Subchapter Q (Specifications) of this chapter.

(n) *Water.* (1) For each person the liferaft is certified to carry, there shall be provided one quart of drinking water consisting of three approved hermetically sealed containers per person, constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to five years from date of packing, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the liferaft after the date of expiration.

(2) The drinking water containers shall be stowed in compartments providing suitable protection.

(o) *Water light.* The water light shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the liferaft by a 12-thread manila lanyard 3 fathoms in length.

§ 94.20–30 Required equipment for lifefloats and buoyant apparatus.

(a) The lifefloats and buoyant apparatus for all vessels shall be equipped in accordance with Table 94.20–30(a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 94.20–35. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 94.20–35.

TABLE 94.20–30(a)

Letter identification	Item	Number required for each lifefloat and buoyant apparatus		
		Ocean and coastwise	Great Lakes	Lakes, bays, sounds, and rivers
a	Boathook [1]	1	1	1
b	Lifeline	1	1	1
c	Paddles [1]	4	4	4
d	Painter	1	1	1
e	Water light [2]	1	1	None

[1] Buoyant apparatus need not be equipped with boathook or paddles.
[2] Equipment for 24 persons or less not required to have a water light.

§ 94.20–35 Description of equipment for lifefloats and buoyant apparatus.

(a) *Boathook.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 6 feet long and 1½ inches in diameter.

(b) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the lifefloat or buoyant apparatus, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(c) *Paddles.* Paddles shall be not less than 5 feet long.

(d) *Painter.* (1) The painter for buoyant apparatus shall be of manila rope not less than 2 inches in circumference and of a length not less than 6 feet plus the distance between the deck on which the buoyant apparatus is stowed and the light draft of the vessel.

(2) The painter for lifefloats shall be of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the deck on which the lifefloats are stowed and the light draft of the vessel.

(e) *Water light.* The water light shall be of an approved type, constructed in accordance with Subpart 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the lifefloat or buoyant apparatus by a 12-thread manila lanyard 3 fathoms in length.

§ 94.20–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.20–5 through 94.20–35 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.20–5 through 94.20–35 may be continued in service so long as they are maintained in a good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this part.

(2) Lifeboats previously approved without automatic drain plugs shall have two plugs or caps attached to the lifeboat by separate chains.

(3) Decked lifeboats shall have no drain holes or plugs, but shall be equipped with two bilge pumps.

(4) On vessels certificated for ocean or coastwise service and contracted for prior to November 19, 1952, unless other approved means are provided to achieve the same purpose, three ½-inch-diameter manila grablines shall be fitted extending from gunwale to gunwale under the keel to enable persons to cling to and climb upon the upturned lifeboat. The ends of each grabline shall be securely attached to the side benches or other permanent part of the lifeboat and each grabline shall be made up with figure eight knots spaced approximately 18 inches apart in order to provide hand grips. Means shall be provided for taking up any slack in the grablines.

Subpart 94.25—Davits for Lifeboats

§ 94.25–1 Application.

(a) The provisions of this subpart, with the exception of § 94.25–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.25–90.

§ 94.25–5 General.

(a) All gravity and mechanical type davits shall be of an approved type, constructed in accordance with Subpart 160.032 of Subchapter Q (Specifications) of this chapter.

(b) Davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

(c) All davits shall be so arranged that the lifeboats do not require lifting prior to being swung out, except on small vessels where such requirement is unreasonable or impracticable in the opinion of the Officer in Charge, Marine Inspection.

(d) All davits and necessary gear shall be such as to meet the requirements for the installation test set forth in Subpart 94.35. The design, arrangements, and installation shall be such as to preclude undue delay in getting lifeboats into the water, and shall be of such strength that the lifeboats can be turned out manned by a launching crew and then safely lowered with the full complement of persons and equipment, with the ship listed to 15 degrees either way and with a 10-degree trim.

(e) Radial davits, where permitted, shall comply with the following requirements:

(1) They shall be fitted with means to prevent them from being jerked from their sockets.

(2) They shall maintain a factor of safety of six based on the weight of the fully equipped and loaded lifeboat, except that the weight of the fully equipped lifeboat alone may be used where the lifeboat is launched before being loaded with people.

(3) They shall be fitted with hand gear of sufficient power to insure that the boat can be turned out against a maximum list of 15 degrees.

(4) They shall be shop tested and show no permanent set or undue stress when subjected to a load equal to 2.2 times the working load. In addition, they shall be shop tested with a load equal to 1.1 times the weight of the fully equipped lifeboat with the davit set up to simulate a 15-degree list inboard, and it shall be determined that the hand gear can adequately handle the load in this condition.

(f) Davits shall be so disposed on one or more decks as to permit the lifeboats placed under them to be safely lowered without interference from the operation of any other davits.

(g) On a vessel on which inflatable liferafts have been substituted for lifeboats, a launching device for each lifeboat to be used for rescue purposes shall be installed. Radial type davits or other means may be used in sheltered waters if acceptable to the Officer in Charge, Marine Inspection.

§ 94.25–10 Requirements for vessels in ocean or coastwise service.

(a) All vessels shall be fitted with a set of approved gravity or mechanical davits for each lifeboat carried except that on small vessels radial type davits or other means may be used if specifically approved by the Commandant.

(b) All davit installations shall have 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest sea going draft with the vessel listed 15 degrees either way.

§ 94.25–15 Requirements for vessels in Great Lakes, lakes, bays, and sounds, or river service.

(a) All vessels shall be fitted with a set of approved gravity or mechanical davits for each lifeboat carried, except that on small vessels, radial type davits or other means may be used if specifically approved by the Commandant.

(b) For vessels in Great Lakes service, all davit installations shall have 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest draft with the vessel listed 15 degrees either way.

§ 94.25–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.25–5 through 94.25–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.25–5 through 94.25–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be made to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable specifications or requirements.

(2) On vessels the keels of which were laid after September 1, 1941, all davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

Subpart 94.30—Lifeboat Winches

§ 94.30–1 Application.

(a) The provisions of this subpart, with the exception of § 94.30–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 94.30–90.

§ 94.30–5 General.

(a) All lifeboat winches shall be of an approved type, constructed in accordance with Subpart 160.015 of Subchapter Q (Specifications) of this chapter.

(b) Where ice conditions are likely to be encountered, suitable fabric covers shall be provided for all lifeboat winches, so fitted over exposed mechanism, that ice formations may be readily broken adrift when necessary to operate the winch.

(c) Where lifeboat winches are used, wire falls shall be employed.

§ 94.30–10 Number and type required.

(a) Lifeboat winches shall be fitted for each set of davits on all vessels in ocean or coastwise service where the height of the deck on which lifeboats are carried exceeds 20 feet from the lightest seagoing draft.

(b) Lifeboat winches shall be used in all cases where gravity type davits are employed.

(c) Lifeboat winches for use with gravity davits shall have grooved drums of such size that there will be only one layer of wire on the drums. Lifeboat winches for use with mechanical davits need not have grooved drums, and may be designed to take more than one layer of wire.

§ 94.30–15 Installation.

(a) Lifeboat winches shall be so located that the operator can observe the movement of the lifeboat during the lowering operation. In addition, any electrical controls provided shall meet the requirements of Subpart 111.65 of Subchapter J (Electrical Engineering) of this chapter.

(b) The lead of the falls to the lifeboat winches and length and size of wire shall be in accordance with Subpart 94.33.

§ 94.30–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.30–5 through 94.30–15 with the exception of § 94.30–10 (a), shall be complied with insofar as the number and general type of equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.30–5 through 94.30–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. However, all new installations or major replacements shall meet the applicable specifications or requirements.

(2) Existing arrangements previously approved, but not meeting the requirements of § 94.30–15 (a), need not be changed. However, new installations or major alterations should conform with such requirements where reasonable and practicable.

(3) Where lifeboat winches are used with gravity davits, the installation shall comply with the requirements contained in § 160.015–3(k) of Subchapter Q (Specifications) of this chapter for lifeboat winches.

Subpart 94.33—Blocks and Falls for Lifeboats

§ 94.33–1 Application.

(a) The provisions of this subpart, with the exception of § 94.33–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.33–90.

§ 94.33–5 General.

(a) All blocks, falls, fairleads, padeyes, shackles, links, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of six, based on the maximum working load.

(b) Falls shall be of such length that the lifeboat may be lowered to the water with the vessel at its lightest draft, listed 15 degrees either way.

(c) Falls, where exposed and subject to damage or fouling, shall be suitably protected.

(d) Such blocks or other fittings shall be fitted as are necessary to permit the falls to lead fair in all positions of the davits.

(e) Means for lubrication shall be provided for all moving parts of blocks, sheaves, fairleads, etc.

§ 94.33–10 Installations where lifeboat winches are used.

(a) All falls shall be of wire rope.

(b) Wire rope falls of 6 x 19 regular lay filler wire construction, prelubricated at the factory with suitable neutral wire rope lubricant, shall be accepted as standard. Any other wire rope, superior or equal to this minimum standard may be used if specifically approved.

(c) Not more than two-part falls may be used, except in special cases where three-part falls may be permitted by the Commandant.

(d) The lead sheaves to the drums shall be located so as to provide fleet angles of not more than 8 degrees for grooved drums and not more than 4 degrees for nongrooved drums. By fleet angle is meant the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum and the line formed by the wire rope when led from the lead sheave to either extremity of the drum.

(e) Sheaves shall have a diameter at the base of the groove at least equal to 12 times the diameter of the wire rope.

§ 94.33–15 Installations where lifeboat winches are not used.

(a) All falls shall be of manila rope or equivalent. Wire rope may not be used.

(b) All vessels of over 1,000 gross tons shall be provided with covered tubs, boxes, or reels for the stowage and protection of the falls, and cruciform bitts shall be provided for properly lowering the lifeboats. Vessels of 1,000 gross tons and less shall have the falls protected from ice and ready for immediate use, and shall be provided with suitable lowering bitts or cleats.

(c) There shall be ample clearance between the cheeks of all blocks. The width between the cheeks shall be ½ inch greater than the diameter of new rope when rope of 3¾ inches circumference or greater is used. Blocks for smaller rope shall be designed with proportional clearances.

§ 94.33–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.33–5 through 94.33–15, as applicable, shall be complied with insofar as the general type of equipment is concerned. Existing equipment previously approved, but not meeting the detailed requirements of §§ 94.33–5 through 94.33–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations and replacements may be made to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable requirements.

Subpart 94.35—Installation of Lifeboats, Davits, and Winches

§ 94.35–1 Application.

(a) The provisions of this subpart shall apply to all installations contracted for on or after November 19, 1952, except as set forth in § 97.15–45(c) of this subchapter.

§ 94.35–5 Tests and examinations.

(a) Upon completion of installation of lifeboats, davits, or winches, tests and examinations as required by this section shall be made to the satisfaction of the inspector before the vessel may be navigated.

(b) The lifeboat shall be swung out from the chocks and lowered to the embarkation deck. At this point the lifeboat shall be loaded with deadweight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load including the weight of the lifeboat. No persons shall be permitted in the lifeboat while it is being loaded or lowered. The lifeboat shall then be lowered to the water and disengaged from the falls.

(1) None of the equipment or parts thereof nor deck connections shall show signs of permanent set or excessive deflection.

(2) Mechanical and radial type davits shall be capable of being swung out without lifting the lifeboat, except on small vessels where such requirement is unreasonable or impracticable in the opinion of the Officer in Charge, Marine Inspection.

(3) The falls shall be of sufficient length to lower the lifeboat as required by § 94.33–5(b).

(4) Where lifeboat winches are used, the following additional determinations shall be made:

(i) During lowering, the lifeboat shall be stopped at intervals of approximately six feet by the action of the counterweight alone. The counterweight shall be capable of stopping and holding the lifeboat. The brake action shall be smooth, but positive.

(ii) Brakes exposed to the weather shall be tested under the load conditions with the braking surfaces both wet and dry.

(iii) The governor brake shall be capable of controlling the speed of lowering of the fully equipped lifeboat with its complement of persons on board to not more than 120 feet per minute. In addition, the speed of lowering of the fully equipped lifeboat without its complement of persons shall be not less than 40 feet per minute.

Subpart 94.40—Life Preservers

§ 94.40–1 Application.

(a) The provisions of this subpart, with the exception of § 94.40–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.40–90.

§ 94.40–5 General.

(a) All life preservers shall be of an approved type, constructed in accordance with Subparts 160.002, 160.005, or 160.055 of Subchapter Q (Specifications) of this chapter.

(b) All life preservers on vessels on an international voyage shall be provided with a whistle of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order. It shall be attached to the life preserver by the lanyard alone without hooks, snaps, clips, etc., and shall extend not less than 15 inches from the life preserver body. While stowed on the life preserver, the whistle lanyard shall be coiled and stopped-off.

§ 94.40–10 Number required.

(a) All vessels shall be provided with a life preserver for each person on board except as specifically modified by paragraph (b) of this section.

(b) For vessels in Great Lakes service of 3000 tons or over having berthing and/or working spaces forward widely separated from messing or recreational spaces aft there shall be provided in addition to those life preservers required by paragraph (a) of this section sufficient additional life preservers for 50 percent of the total number of persons on board.

(c) In addition to the life preservers required by paragraph (a) of this section, all vessels on an international voyage shall be provided with approved type life preservers for 5 percent of the persons carried. Such vessels carrying persons in addition to the crew shall be provided with life preservers suitable for children when children are aboard.

§ 94.40–15 Distribution and stowage.

(a) *Distribution.* (1) Life preservers shall be properly distributed throughout the crew quarters and other readily accessible places. If passengers are carried in addition to the crew, the additional life preservers shall be placed in the staterooms, berthings, and other places convenient for the passengers.

(2) The additional 50 percent life preservers required by § 94.40–10(b) shall be properly stowed in the vicinity of the lifeboats.

(b) *Stowage.* (1) Lockers, boxes, and closets in which life preservers are stowed shall not be capable of being locked, shall be plainly marked, and the life preservers contained therein shall be readily available.

(2) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed. Where life preservers are stowed at a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution to be operated by persons standing on the deck.

§ 94.40–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.40–5 through 94.40–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.40–5 through 94.40–15 may be continued in service so long as they are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection, except that:

(i) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts, as required by Subparts 160.002 and 160.005 of Subchapter Q (Specifications) of this chapter, shall be removed from service.

(2) All new installations or replacements shall meet the applicable specifications or requirements, except that:

(i) Cork and balsa wood life preservers, constructed in accordance with the applicable provisions of Subpart 160.003 or 160.004 and manufactured as approved life preservers prior to July 1, 1965, may be accepted as new or replacement equipment required by this subchapter if such life preservers are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection: *Provided, however,* That such life preservers bearing basic Approval No. 160.003 or 160.004 shall not be considered as approved equipment meeting the requirements for those cargo ships on an international voyage, constructed or contracted for on or after May 26, 1965.

Subpart 94.43—Ring Life Buoys and Water Lights

§ 94.43–1 Application.

(a) The provisions of this subpart, with the exception of § 94.43–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.43–90.

§ 94.43–5 General.

(a) All ring life buoys shall be of an approved type, constructed in accordance with Subpart 160.009 or 160.050 of Subchapter Q (Specifications) of this chapter.

(b) All water lights shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter.

(c) All self-activating smoke signals shall be of an approved type, constructed in accordance with the requirements of Subpart 160.057 of Subchapter Q (Specifications) of this chapter which shall be capable of producing smoke of a highly visible color for at least 15 minutes.

§ 94.43–10 Number required.

(a) The minimum number of approved 30-inch ring life buoys and the minimum number of which shall have water lights attached, shall be in accordance with Table 94.43–10(a): *Provided,* That unmanned barges are exempt from this section.

(b) One of the ring life buoys on each side of the vessel shall have secured to it a line at least 15 fathoms in length. On vessels on an international voyage, the line shall be of a buoyant type.

(c) On vessels on an international voyage, at least two of the ring life buoys with water lights attached as required by Table 94.43–10(a) shall also be provided with an approved self-activated smoke signal and shall be capable of quick release from the bridge.

TABLE 94.43–10(a)

Length of vessel in feet	Ocean[1]		All services other than ocean	
	Minimum number of ring life buoys	Minimum number of ring life buoys in column 2 which shall have water lights attached	Minimum number of ring life buoys	Minimum number of ring life buoys in column 4 which shall have water lights attached
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
Under 100	6	6	2	0
100 and under 200	8	6	4	2
200 and under 300	8	6	6	2
300 and under 400	12	6	12	4
400 and under 600	18	9	18	9
600 and under 800	24	12	24	12
800 and over	30	15	30	15

[1] Manned barges shall be equipped with 1 ring life buoy at each end of the vessel.

(d) On vessels on an international voyage, the ring life buoys required by this section shall be orange in color.

§ 94.43–15 Distribution and securing.

(a) All ring life buoys shall be placed so as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned.

(b) The ring life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

§ 94.43–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.43–5 through 94.43–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.43–5 through 94.43–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this subpart.

Subpart 94.45—Line-Throwing Appliances

§ 94.45–1 Application.

(a) The provisions of this subpart, with the exception of § 94.45–90, shall apply to all mechanically propelled vessels of 150 gross tons and over in ocean or coastwise service. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 94.45–90.

§ 94.45–5 General.

(a) Line-throwing appliances of the impulse-projected rocket type, and the equipment auxiliary thereto, shall be of an approved type, constructed in accordance with Subpart 160.040 of Subchapter Q (Specifications) of this chapter. The service use of rockets shall be limited to a period of four years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such rockets are available, except that replacement shall be made in all cases within twelve months after the date of expiration.

(b) Line-throwing appliances of the shoulder-gun type, and the equipment auxiliary thereto, shall be of an approved type, constructed in accordance with Subpart 160.031 of Subchapter Q (Specifications) of this chapter.

§ 94.45–10 Type required.

(a) All vessels shall be fitted with an approved line-throwing appliance of the impulse-projected rocket type. However, vessels of less than 500 gross tons may substitute a line-throwing appliance of the shoulder-gun type.

§ 94.45–15 Equipment for line-throwing appliances.

(a) The equipment enumerated in this paragraph shall be carried for impulse-projected rocket type line-throwing appliances. Except as noted, the equipment and the appliance shall be stowed together in a suitable case or box:

(1) Four rockets, two of which shall be of the buoyant type.

(2) Four primer-ejector cartridges.

(3) Four service lines, each of a length not less than that specified in the approval of the appliance carried, of 7/32-inch to 9/32-inch diameter, of flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels. These lines may be kept either in the box or case with the remainder of the equipment, or be stowed in an accessible location nearby.

(4) One cleaning brush, one can of oil, and twelve wiping patches.

(5) One set of instructions furnished by the manufacturer.

(6) One auxiliary line, 1,500 feet of 3-inch circumference manila. This line may be kept either in the box or case with the remainder of the equipment or be stowed in an accessible location nearby.

(b) The equipment enumerated in this paragraph shall be carried for shoulder-gun-type line-throwing appliances. Except as noted, the equipment and the appliance shall be stowed together in a suitable case or box.

(1) Ten service projectiles.

(2) Twenty-five cartridges.

(3) Four service lines, each not less than 400 feet in length, of ⅜-inch circumference flax or cotton and having a breaking strength of at least 250 pounds, or each not less than 600 feet in length of 1/16-inch or more diameter woven or braided nylon, very flexible, having a breaking strength not less than 140 pounds, or equivalent, to be kept in faking boxes or on reels. These lines may be kept either in the box or case with the remainder of the equipment or be stowed in an accessible location nearby.

(4) One cleaning rod with brush, one can of oil, and twelve wiping patches.

(5) One set of instructions furnished by the manufacturer.

(6) One auxiliary line, 500 feet of 3 inch circumference manila.

§ 94.45–20 Accessibility.

(a) The line-throwing appliance and its equipment shall be kept easily and readily accessible and ready for use. No part of this equipment shall be used for any other purpose.

§ 94.45–25 Service recommendations.

(a) In firing the line-throwing appliances, the operating instructions and safety precautions furnished by the manufacturer should be followed.

§ 94.45–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels of 150 gross tons and over in ocean or coastwise service contracted for prior to November 19, 1952, shall meet the requirements set forth in §§ 94.45–5 through 94.45–25. However, if a Lyle gun-type line-throwing appliance is already in service on such vessel, it may be continued in use so long as it is in good and serviceable condition, but may not be replaced by a similar installation. Where Lyle guns are used, the following requirements shall be met:

(1) The equipment enumerated in this subparagraph shall be carried for Lyle gun type line-throwing appliances. The equipment and the gun shall be stowed together in a suitable case or box. If the case or box does not meet the requirements of Subpart 160.038 of Subchapter Q (Specifications) of this chapter for portable magazine chest, the powder and primers shall be separately stowed in a chest meeting such requirement.

(i) Six service projectiles.

(ii) Eighteen bags (2½ ounces each) of black powder marked "One-half normal charge for Lyle gun, 2½ ounces black powder" in a nonferrous metal screw-top container.

(iii) One approved firing attachment with accessories consisting of lanyard, wrench, washer to fit between barrel and shoulder of firing attachment, blank plug for screwing into gun when firing attachment is not in place, cartridge extractor, and 25 primers in a watertight metal box.

(iv) Twenty-five paper wads.

(v) Four service lines, each 1,700 feet in length, of 7/32-inch to 9/32-inch diameter flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels.

(vi) One ram rod, 1 wire brush, 1 can of light petrolatum, and 12 wiping patches.

(vii) One tapered wooden plug for muzzle of gun when not in use.

(viii) One set of instructions furnished by the manufacturer of the gun.

(ix) One auxiliary line, 1,500 feet of 3-inch circumference manila.

(2) Accessibility. Same as § 94.45–20.

Subpart 94.50—Embarkation Aids

§ 94.50–1 Application.

(a) The provisions of this subpart, with the exception of § 94.50–90, shall apply to all vessels other than yachts and fishing vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.50–90.

§ 94.50–5 Ladders.

(a) *General.* All ladders required by this section shall be of an approved type constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter.

(b) *Vessels in ocean, coastwise or Great Lakes service.* (1) All vessels in ocean, coastwise or Great Lakes service shall have an approved Type II (chain suspension) ladder for each set of lifeboat davits, but existing ladders previously approved by the Coast Guard may be continued in service so long as they are maintained in good condition. Such ladders shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line, no heel assumed.

(2) All ocean and coastwise vessels which normally employ a pilot shall have a ladder for the use of the pilot in addition to the ladders required by subparagraph (1) of this paragraph. Suitable spreaders, a man rope, and a safety line shall be kept readily available for use in conjunction with the pilot ladder whenever circumstances may so require. When used, the ladder shall be secured in a position so that each step rests firmly against the ship's side, and so the pilot can gain safe and convenient access to the ship after climbing not more than 30 feet. Whenever the distance from sea level is more than 30 feet, access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means. Arrangements shall be such that the rigging of the ladder and the embarkation and debarkation of the pilot is supervised by a responsible officer of the ship, and handholds are provided to assist the pilot to pass safely and conveniently from the head of the ladder into the ship and onto the ship's deck. At night a light shining over the side shall be available for use, and the deck at the position where the pilot boards the ship shall be adequately lighted.

§ 94.50–7 Embarkation aids into inflatable liferafts.

(a) Where inflatable liferafts are substituted for lifeboats, unless freeboard at embarkation point is such that embarkation devices are not necessary, suitable arrangements shall be made for embarkation which shall include sufficient ladders or other suitable devices to facilitate embarkation into the inflatable liferates when waterborne.

§ 94.50–10 Illumination for lifeboat launching operations.

(a) Provisions shall be made on all vessels on an international voyage and all other vessels where the lifeboat deck is more than 30 feet above the light water line, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of or immediately after being launched. Details of the illuminating system shall be in accordance with Subchapter J (Electrical Engineering) of this chapter.

§ 94.50–15 Illumination for liferaft stowage areas.

(a) For all vessels on an international voyage, suitable illumination shall be provided for the liferaft stowage areas.

§ 94.50–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.50–5 through 94.50–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements of §§ 94.50–5 through 94.50–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements.

(2) The illumination for lifeboat launching operations need not meet the detailed requirements of Subchapter J (Electrical Engineering) of this chapter.

Subpart 94.55—Portable Radio Apparatus

§ 94.55–1 Required on international voyage.

(a) All vessels on an international voyage shall be provided with a portable radio apparatus complying with the requirements of the Federal Communications Commission unless at least one lifeboat on each side of the vessel is fitted with a fixed radio installation. Such portable radio shall be kept in the radioroom, chartroom, or other suitable location ready to be moved to one or other of the lifeboats in the event of an emergency.

Subpart 94.90—Ship's Distress Signals

§ 94.90–1 Application.

(a) The provisions of this subpart shall apply to all manned vessels of 150 gross tons and over as specifically noted.

§ 94.90–5 Vessels in ocean or coastwise service.

(a) All vessels in ocean and coastwise service shall carry within the pilothouse or on the navigator's bridge twelve approved hand-held rocket-propelled parachute red flare distress signals, contained in a portable watertight container, constructed in accordance with Subpart 160.036 of Subchapter Q (Specifications) of this chapter. The service use of the distress signals shall be limited to a period of three years from date of manufacture, and replacement of outdated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within twelve months after the date of expiration.

§ 94.90–10 Vessels in Great Lakes service.

(a) All vessels in Great Lakes service shall carry within the pilothouse or on the navigator's bridge, twelve approved hand-held red flare distress signals, contained in a portable watertight container, constructed in accordance with Subpart 160.021 or Subpart 160.023 of Subchapter Q (Specifications) of this chapter. The service use of distress signals shall be limited to a period of three years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within twelve months after the date of expiration.

PART 95—FIRE PROTECTION EQUIPMENT

Subpart 95.01—Application

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95.01–5 Equipment installed but not required.

Subpart 95.05—Fire Detecting and Extinguishing Equipment, Where Required

95.05–1 Fire detecting, manual alarm, and supervised patrol systems.
95.05–5 Fire main system.
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95.15–5 Quantity, pipe sizes, and discharge rates.
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95.17–5 Quantity of foam required.
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Subpart 95.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems, Arrangements and Details

95.50–1 Application.
95.50–5 Classification.
95.50–10 Location.
95.50–15 Spare charges.
95.50–90 Vessels contracted for prior to November 19, 1952.

Subpart 95.60—Fire Axes

95.60–1 Application.
95.60–5 Number required.
95.60–10 Location.

AUTHORITY: The provisions of this Part 95 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 95.01—Application

§ 95.01–1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

§ 95.01–5 Equipment installed but not required.

(a) Where fire detecting or extinguishing systems or equipment are not required, but are installed, the system or equipment and its installation shall meet the requirements of this part.

Subpart 95.05—Fire Detecting and Extinguishing Equipment, Where Required

§ 95.05–1 Fire detecting, manual alarm, and supervised patrol systems.

(a) Fire detecting, manual alarm, and supervised patrol systems are normally not required. However, if installed, whether required or not, such systems shall meet the applicable requirements of Part 76 of Subchapter H (Passenger Vessels) of this chapter.

(b) In each compartment containing explosives, and in adjacent cargo compartments, there shall be provided a smoke detecting or other suitable type fire detecting system.

§ 95.05–5 Fire main system.

(a) Fire pumps, hydrants, hose, and nozzles shall be installed on the following vessels:

(1) On all self-propelled vessels.

(2) On all barges with sleeping accommodations for more than 12 persons.

(b) The arrangements and details of the fire main system shall be as set forth in Subpart 95.10.

§ 95.05–10 Fixed fire extinguishing systems.

(a) Approved fire extinguishing systems may be used or required in locations delineated in this section on the following vessels:

(1) On all self-propelled vessels other than yachts and fishing vessels.

(2) On all barges with sleeping accommodations for more than 12 persons.

(b) A fixed carbon dioxide or other approved system shall be installed in all cargo compartments and tanks for combustible cargo, except that vessels engaged exclusively in the carriage of coal or grain in bulk need not be fitted with such system. For cargo compartments and tanks fitted with a fixed carbon dioxide or other approved system a deck foam system is not required. The provisions of this paragraph shall not apply to motorboats contracted for prior to November 19, 1952. In lieu of the carbon dioxide or other approved system, the following systems may be used or required in special cases:

(1) A fixed foam system may be used in cargo tanks.

(2) In cases where a cargo compartment is normally accessible and is considered to be a part of the working or living quarters, a water sprinkling system may be required, and the details of such system will be subject to special approval.

(3) On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted. However, although existing steam smothering systems may be repaired, replaced, or extended, no new systems contracted for on or after January 1, 1962, will be permitted.

(c) On vessels other than motorboats a fixed carbon dioxide or other approved system shall be installed in all lamp and paint lockers, oil rooms, and similar spaces. On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted in lieu of the carbon dioxide system. However, although existing steam smothering systems may be repaired, replaced, or extended, no new systems contracted for on or after January 1, 1962, will be permitted.

(d) On vessels of 1,000 gross tons and over, contracted for on or after November 19, 1952, or where conversion from coal to oil is contracted for on or after November 19, 1952, a fixed carbon dioxide, foam, or water spray system shall be installed in all spaces containing oil fired boilers, either main or auxiliary, or their fuel oil units, valves, or manifolds in the line between the settling tanks and the boilers.

(e) If a fixed fire extinguishing system is installed to protect an internal combustion propelling machinery installation, the system shall be of the carbon dioxide type.

(f) On vessels contracted for on or after November 19, 1952, where an enclosed ventilating system is installed for electric propulsion motors or generators, a fixed carbon dioxide extinguishing system shall be installed in such system.

(g) The arrangements and details of the fixed fire extinguishing systems shall be as set forth in Subparts 95.13 through 95.17.

§ 95.05–15 Hand portable fire extinguishers and semiportable fire extinguishing systems.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed on all

vessels, other than unmanned barges and fishing vessels, as set forth in Subpart 95.50.

§ 95.05–20 Sand.

(a) On vessels of over 1,000 gross tons there shall be in each space containing oil fired boilers a metal receptacle containing not less than 10 cubic feet of sand, sawdust impregnated with soda, or other approved dry materials together with a scoop or shaker for distributing the same. On vessels of 1,000 gross tons or less, at least 5 cubic feet of such materials shall be similarly carried.

(b) In lieu of the requirements in paragraph (a) of this section, one B–II fire extinguisher may be substituted.

Subpart 95.10—Fire Main System, Details

§ 95.10–1 Application.

(a) The provisions of this subpart, with the exception of § 95.10–90, shall apply to all fire main installations contracted for on or after May 26, 1965. Installations contracted for prior to May 26, 1965, shall meet the requirements of § 95.10–90.

§ 95.10–5 Fire pumps.

(a) Vessels shall be equipped with independently driven fire pumps in accordance with Table 95.10–5(a).

TABLE 95.10–5 (a)

Gross tons		Minimum number of pumps	Hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
-----	100	[1] 1	[1] 1½	[1] ½	[1] 50
100	1,000	1	1½	⅝	50
1,000	1,500	2	1½	⅝	50
1,500	-----	2	[2] 2½	[2] ⅞	[2] 50

[1] On vessels of 65 feet in length or less, ¾-inch hose of good commercial grade together with a commercial garden hose nozzle may be used. The pump may be hand operated and the length of hose shall be sufficient to assure coverage of all parts of the vessel.

[2] 75 feet of 1½-inch hose and ⅝-inch nozzle may be used where specified by § 95.10–10 (b) for interior locations and 50 feet of 1½-inch hose may be used in exterior locations on vessels in other than ocean or coastwise service.

(b) On vessels of 1,000 gross tons and over on an international voyage, each required fire pump, while delivering water thru the fire main system at a pressure corresponding to that required by paragraph (c) of this paragraph, shall have a minimum capacity of at least two-thirds of that required for an independent bilge pump. However, in no case shall the capacity of each fire pump be less than that otherwise required by this section.

(c) Each pump shall be capable of delivering water simultaneously from the two highest outlets at a Pitot tube pressure of approximately 50 p. s. i. Where 1½-inch hose is permitted in lieu of 2½-inch hose by footnote 2 of Table 95.10–5 (a), the pump capacity shall be determined on the same basis as if 2½-inch hose had been permitted. Where ¾-inch hose is permitted by Table 95.10–5 (a), the Pitot tube pressure need be only 35 p. s. i.

(d) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 p. s. i. in excess of the pressure necessary to maintain the requirements of paragraph (c) of this section or 125 p. s. i., whichever is greater. Relief valves may be omitted if the pumps, operating under shut-off conditions, are not capable of developing a pressure exceeding this amount.

(e) Fire pumps shall be fitted with a pressure gage on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. Unless specifically approved by the Commandant, no branch lines shall be connected to the fire mains for other than fire and deck wash purposes. Other discharge lines shall lead from a discharge manifold near the fire pump. In no case shall a pump having connection to an oil line be used as a fire pump.

(g) The total area of the pipes leading from a pump shall not be less than the discharge area of the pump.

(h) On vessels with oil fired boilers, either main or auxiliary, or with internal combustion propulsion machinery, where 2 fire pumps are required, they shall be located in separate spaces, and the arrangement of pumps, sea connections, and sources of power shall be such as to insure that a fire in any one space will not put all of the fire pumps out of operation. However, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement due to the size or arrangement of the vessel, or for other reasons, the installation of a total flooding carbon dioxide system may be accepted as an alternate method of extinguishing any fire which would affect the powering and operation of at least one of the required fire pumps.

§ 95.10–10 Fire hydrants and hose.

(a) The size of fire hydrants, hose, and nozzles and the length of hose required shall be as noted in Table 95.10–5(a).

(b) In lieu of the 2½-inch hose and hydrants specified in Table 95.10–5 (a), on vessels over 1,500 gross tons, the hydrants in interior locations may have siamese connections for 1½-inch hose. In these cases the hose shall be 75 feet in length, and only one hose will be required at each fire station; however, if all such stations can be satisfactorily served with 50-foot lengths, 50-foot hose may be used.

(c) On vessels of 1,000 gross tons and over there shall be at least one shore connection to the fire main available to each side of the vessel in an accessible location. Suitable cut-out valves and check valves shall be provided. Suitable adapters also shall be provided for furnishing the vessel's shore connections with couplings mating those on the shore fire lines. Such vessels on an international voyage, shall be provided with at least one international shore connection. Facilities shall be available enabling such a connection to be used on either side of the vessel. The international shore connection shall be in accordance with specification Subpart 162.034 of Subchapter Q (Specifications) of this chapter.

(d) Fire hydrants shall be of sufficient number and so located that any part of the vessel, other than main machinery spaces, accessible to persons on board while the vessel is being navigated and all cargo holds may be reached with at least 2 streams of water from separate outlets, at least one of which shall be from a single length of hose. In main machinery spaces, all portions of such spaces shall be capable of being reached by at least 2 streams of water, each of which shall be from a single length of hose from separate outlets; however, this requirement need not apply to shaft alleys containing no assigned space for the stowage of combustibles. Fire hydrants shall be numbered as required by § 97.37–15 of this subchapter.

(e) All parts of the fire main located on exposed decks shall either be protected against freezing or be fitted with cut-out valves and drain valves so that the entire exposed parts of such piping may be shut off and drained in freezing weather. Except when closed to prevent freezing, such valves shall be sealed open.

(f) The outlet at the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead horizontally or downward to minimize the possibility of kinking.

(g) Each fire hydrant shall be provided with a single length of hose with nozzle attached and a spanner. A suitable hose rack or other device shall be provided for the proper stowage of the hose. If the hose is not stowed in the open or behind glass so as to be readily seen, the enclosure shall be marked in accordance with § 97.37–15 of this subchapter.

(h) Fire hose shall be connected to the outlets at all times. However, on open decks where no protection is afforded to the hose in heavy weather, or where the hose may be liable to damage from the handling of cargo, the hose may be temporarily removed from the hydrant and stowed in an accessible nearby location.

(i) Hose nozzles shall be as follows:

(1) All nozzles shall be of good grade bronze or equivalent metal.

(2) Where smooth bore type nozzles are used, they shall have an orifice of the size indicated in Table 95.10–5 (a).

(3) Where combination solid stream and water spray fire hose nozzles are used, they shall be of approved type. New installations and replacements shall be constructed in accordance with subpart 162.027 of subchapter Q (Specifications) of this chapter. The detachable applicator shall be stowed adjacent to the fire hydrant, except where combination nozzles are not required, in which case the applicator may be stowed at the discretion of the master.

(4) Except as noted in subparagraphs (5) and (6) of this paragraph, all hose nozzles shall be of either the smooth bore type or the approved type combination nozzle.

(5) On all vessels of 1,000 gross tons and over, the hose attached to the hydrants in propulsion machinery spaces containing oil fired boilers, internal combustion machinery, or oil fuel units shall be fitted with an approved combination nozzle. The applicator shall be not more than 6 feet in length.

(6) Where ¾-inch hose is permitted by Table 95.10–5 (a), a good commercial grade garden hose nozzle or equivalent will be accepted.

(7) Where approved combination nozzles are used, but are not required, the applicators with low velocity fog spray heads and the self-cleaning strainers may be fitted, but will not be required.

(j) Firehose shall not be used for any other purpose than fire extinguishing, drills, and testing.

(k) Fire hydrants, nozzles, and other fittings shall have threads to accommodate the hose connections noted in paragraph (l) of this section.

(l) Firehose and couplings shall be as follows:

(1) Couplings shall be of brass, bronze, or other equivalent metal. For installations on vessels contracted for on or after July 1, 1954, National Standard fire hose coupling threads shall be used for the 1½-inch and 2½-inch sizes, i. e., 9 threads per inch for 1½-inch hose and 7½ threads per inch for 2½-inch hose.

(2) Unlined hose shall not be used in the machinery spaces.

(3) Where ¾-inch hose is permitted by Table 95.10–5 (a), the hose and couplings shall be of good commercial grade.

(4) All lined and unlined hose installed after January 1, 1961, shall be of fire hose quality, in conformance with Underwriters' Laboratories, Inc., Standard 18 or 19, or Federal Specification JJ–H–571 or ZZ–H–451a. Hose which bears the label of Underwriters' Laboratories, Inc., as inspected lined or unlined fire hose will be accepted as conforming to this requirement.

§ 95.10–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All distribution cut-off valves shall be marked as required by § 97.37–10 of this subchapter.

(c) For vessels on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This requirement is in addition to § 95.10–5(c). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants shall be at a minimum Pitot tube pressure of approximately 50 pounds per square inch.

§ 95.10–90 Installations contracted for prior to May 26, 1965.

(a) Installations contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 95.10–5 through 95.10–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing equipment previously approved, but not meeting the applicable requirements of §§ 95.10–5 through 95.10–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installations. However, all new installations or major replacements shall meet the applicable requirements in this subpart.

(2) All vessels contracted for prior to November 19, 1952, other than motorboats, shall be fitted with fire pumps, hoses, and nozzles in accordance with Table 95.10–90(a)(2).

TABLE 95.10–90(a)(2)

Gross tons		Minimum number of pumps	Minimum hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
-----	100	1	[1] 1½	[1] 5/16	[1] 50
100	1,000	1	[2] 1½	[2] ⅝	[2] 50
1,000	----	2	[2] 1½	[2] ⅝	[2] 50

[1] On vessels of 65 feet in length or less, ¾-inch hose of good commercial grade together with a commercial garden hose nozzle may be used. The pump may be hand operated and the length of hose shall be sufficient to assure coverage of all parts of the vessel.

[2] May use 50 feet of 2½-inch hose with ⅞-inch nozzles for exterior stations. 75 feet of 1½-inch hose with ⅝-inch nozzles may be used for interior station in which case such interior stations shall have siamese connections.

(3) Vessels contracted for prior to July 1, 1935, need not meet the requirements of § 95.10–5(h), and vessels contracted for on or after July 1, 1935, but prior to November 19, 1952, may have a carbon dioxide "bilge" in lieu of "total flooding" system. However, in vessels of both categories where a conversion from coal to oil is contracted for on or after November 19, 1952, the provisions of § 95.10–5(h) shall apply.

(4) The general requirements of § 95.10–5 (c) through (g), § 95.10–10 (d) through (i), and § 95.10–15 shall be complied with insofar as is reasonable and practicable.

Subpart 95.13—Steam Smothering System, Details

§ 95.13–1 Application.

(a) In accordance with § 95.05–10, steam smothering systems are not permitted on vessels contracted for on or after January 1, 1962, nor for new installations on vessels contracted for prior to that date.

(b) Where a steam smothering system is installed, the provisions of this subpart shall apply.

(c) This does not preclude the introduction of steam into such confined spaces as boiler casings or into tanks for steaming out purposes. Such installations are not to be considered as part of any required fire extinguishing system.

§ 95.13–90 Installations contracted for prior to January 1, 1962.

(a) Installations contracted for prior to July 1, 1935, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) The main pipes and their branches to the cargo compartments and similar spaces shall be not less than 1½-inch pipe size and shall emanate from not more than two stations in easily accessible locations. If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing which shall be marked as required by § 97.37–13 of this subchapter. Each branch line shall have a valve at the manifold which shall be marked as required by § 97.37–10 of this subchapter.

(3) Branches to paint lockers and similar small spaces may be taken from the nearest steam supply line and shall be not less than ¾-inch pipe size. The valve shall be marked as required by § 97.37–10 of this subchapter.

(b) Installations contracted for on or after July 1, 1935, but prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from the main or auxiliary boilers to provide at least one pound of steam per hour for each 50 cubic feet of gross volume of the largest compartment protected. Where reasonable and practicable, the steam pressure shall be at least 100 p. s. i.

(3) The piping system shall meet the general requirements of subparagraphs (5) through (12) of paragraph (c) of this section insofar as is reasonable and practicable.

(4) The minimum size of distribution piping and the number of branches to the various spaces shall be as given in Table 95.13–90 (b) (4) or by the following formula:

$$D=\sqrt{\frac{C}{30{,}000}} \qquad (1)$$

where:

D=Required diameter of pipe in inches.
C=Volume of compartment in cubic feet.

TABLE 95.13-90(b)(4)

Volume of compartment in cubic feet		Number of branches to compartment	Pipe size in each branch, inches
Over	Not over		
-------	30,000	1	1
30,000	46,000	1	1¼
46,000	67,000	1	1½
67,000	94,000	2	1¼
94,000	135,000	2	1½
135,000	203,000	3	1½

(5) The minimum size of the steam supply line from the boiler to the distribution manifold shall be as given by the following formula:

$$D=\sqrt{\frac{C}{60{,}000}} \qquad (2)$$

where:

D=Diameter of pipe in inches.
C=Volume of all compartments in cubic feet.

(c) Installations contracted for on or after November 19, 1952, but prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from main or auxiliary boilers to provide at least 1 pound of steam per hour for each 12 cubic feet of the gross volume of the largest compartment to be protected.

(3) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of steam required, a cargo compartment will be considered as the space between adjacent watertight bulkheads and from tank top or lowest deck to the deck head of the uppermost deck on which cargo may be carried. If a trunk extends beyond such deck, the trunk space shall be included. Tonnage openings shall be considered as sealed for this purpose.

(4) A steam pressure of at least 100 p.s.i. shall be available unless specifically approved otherwise.

(5) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(6) The distribution piping shall emanate from not more than three stations in easily accessible locations on the weather deck, and shall lead to the lower portion of each cargo hold, cargo 'tween deck, and other compartments protected. However, lines to paint lockers and similar small spaces may be taken from the nearest steam supply line.

(7) The distribution line to each compartment shall be fitted with a shutoff valve. The valve shall be marked as required by § 97.37-10 of this subchapter.

(8) The manifold steam supply line shall be fitted with a master valve at the manifold.

(9) Provisions shall be made for draining the manifold and distribution lines to prevent them from freezing.

(10) If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing. In any case, it shall be marked as required by § 97.37-13 of this subchapter.

(11) Piping shall not be led into or through spaces accessible to the persons on board while the vessel is being navigated, with the exception of machinery spaces and corridors. However, in special cases, arrangements to run piping through such spaces may be specifically approved by the Commandant, provided all joints are welded, suitable expansion bends are provided, and all piping is extra heavy.

(12) Piping shall be used for no other purposes except that it may be incorporated with the fire-detecting system, if installed, and where suitable provisions are made, it may be used for steaming out tanks.

(13) The minimum size and number of branches to the various spaces shall be as given in Table 95.13-90(c)(13). The distribution piping from the manifold to the branch lines shall have an area approximately equal to the combined areas of the branch lines served.

TABLE 95.13-90 (c)(13)

Volume of space in cubic feet		Number of branches to space	Pipe size of each branch, inches
Over	Not over		
-------	500	1	¾
500	5,000	1	1
5,000	15,000	1	1¼
15,000	30,000	1	1½
30,000	60,000	2	1½
60,000	100,000	3	1½
100,000	190,000	4	1½

(14) The steam supply line from the boiler to any distribution manifold shall be of sufficient size to supply all the branch lines to the largest compartment and to all adjacent compartments.

Subpart 95.15—Carbon Dioxide Extinguishing Systems, Details

§ 95.15-1 Application.

(a) Where a carbon dioxide extinguishing system is installed, the provisions of this subpart, with the exception of § 95.15-90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 95.15-90.

(b) The requirements of this subpart are based on a "high pressure system," i. e., one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for "low pressure systems," i. e., those in which the carbon dioxide is stored in liquid form at a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

§ 95.15-5 Quantity, pipe sizes, and discharge rates.

(a) *General.* The amount of carbon dioxide required for each space shall be as determined by paragraphs (b) through (e) of this section.

(b) *Total available supply.* A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) *Cargo spaces.* (1) The number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space in cubic feet divided by 30.

(2) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of carbon dioxide required, a cargo compartment will be considered as the space between watertight or fire-screen bulkheads and from the tank top or lowest deck to the deck head of the uppermost space on which cargo may be carried. If a trunk extends beyond such deck, the trunk volume shall be included. Tonnage openings shall be considered as sealed for this purpose.

(3) Branch lines to the various cargo holds and 'tween decks shall not be less than ¾-inch standard pipe size.

(4) No specific discharge rate need be applied to such systems.

(d) *Enclosed ventilation systems for rotating electrical propulsion equipment.* (1) The number of pounds of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 10 for systems having a volume of less than 2,000 cubic feet, and divided by 12 for systems having a volume of 2,000 cubic feet or more.

(2) The piping for the initial charge shall be in accordance with Table 95.15-5(e)(4), and the discharge of the required amount shall be completed within 2 minutes.

(3) In addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25 percent concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

(4) The piping for the delayed discharge shall not be less than ½-inch standard pipe, and no specific discharge rate need be applied to such systems. On small systems, this pipe may be incorporated with the initial discharge piping.

(e) *Machinery spaces, paint lockers, tanks, and similar spaces.* (1) Except as provided in subparagraph (3) of this paragraph, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in Table 95.15-5(e)(1). If fuel can drain from the compartment

being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

TABLE 95.15-5(e)(1)

Gross volume of compartment, cubic feet		Factor
Over—	Not over—	
------	500	15
500	1,600	16
1,600	4,500	18
4,500	50,000	20
50,000	--------	22

(2) For the purpose of the requirements of this paragraph, the volume of the machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion machinery, or fuel oil installation extend into such space, in which case the volume shall be taken to the top of the casing or the next material reduction in casing area, whichever is lower. For installations contracted for on or after October 1, 1959, "normal machinery casing" and "material reduction in casing area" shall be defined as follows:

(i) By "normal machinery casing" shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By "material reduction in casing area" shall be meant a reduction to at least 40 percent of the casing area.

(3) For vessels on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by subparagraphs (1) and (2) of this paragraph or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(4) Branch lines to the various spaces shall be as noted in Table 95.15-5(e)(4).

TABLE 95.15-5(e)(4)

Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches
100	½	2,500	2½
225	¾	4,450	3
300	1	7,100	3½
600	1¼	10,450	4
1,000	1½	15,000	4½
2,450	2		

(5) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(6) The number, type, and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(7) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inches.

(8) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

§ 95.15–10 Controls.

(a) Except as noted in § 95.15–20(b) all controls and valves for the operation of the system shall be outside the space protected, and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one hazard, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one hazard, a normally closed stop valve shall be installed between the cylinders and the hazard except for systems of the type indicated in § 95.15–5(e) which contain not more than 300 pounds of carbon dioxide.

(c) Distribution piping to the various cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be marked as required by §§ 97.37–10 and 97.37–13 of this subchapter.

(d) Systems of the type indicated in § 95.15–5(e) shall be actuated by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Those systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in § 95.15–5(e), other than systems for tanks, which are of more than 300 pounds of carbon dioxide, shall be fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for those systems for tanks and for spaces which have a suitable horizontal escape. This paragraph shall be applicable only to systems installed on or after July 1, 1957.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the system shall be located in a conspicuous place at or near the releasing control device.

(i) If the space or enclosure containing the carbon dioxide supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

§ 95.15–15 Piping.

(a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 pounds per square inch.

(b) All piping, in nominal sizes not over ¾ inch shall be at least Schedule 40 (standard weight) and in nominal sizes over ¾ inch, shall be at least Schedule 80 (extra heavy).

(c) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 pounds per square inch shall be installed in the distributing manifold or such other location as to protect the piping in the event that all branch line shut-off valves are closed.

(e) All dead-end lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire-detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements are:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 pounds per square inch. With no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150 pounds per square inch per minute for a 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding subparagraph with the exception that the pressure used shall

be 600 pounds per square inch in lieu of 1,000 pounds per square inch. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in subparagraphs (1) through (3) of this paragraph, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, etc., may be tested by blowing out the piping with air at a pressure of at least 100 pounds per square inch.

§ 95.15–20 Carbon dioxide storage.

(a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in § 95.15–5(e), consisting of not more than 300 pounds of carbon dioxide, may have the cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated ambient temperature in excess of 130 degrees F.

(d) Cylinders shall be securely fastened and supported, and where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent siphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide shall be fabricated, tested, and marked in accordance with the regulations of the Interstate Commerce Commission as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 95.15–25 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

§ 95.15–30 Alarms.

(a) Spaces which are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm in such spaces which will be automatically sounded when the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by § 97.37–9 of this subchapter. For systems installed on or after July 1, 1957, alarms will be mandatory only for systems required to be fitted with a delayed discharge. Such alarms shall be so arranged as to sound during the 20 second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend on no source of power other than the carbon dioxide.

§ 95.15–35 Enclosure openings.

(a) Where mechanical ventilation is provided for spaces other than cargo and similar spaces which are protected by a carbon dioxide extinguishing system, provisions shall be made so that the ventilation system is automatically shut down with the operation of the system to that space.

(b) Where natural ventilation is provided for spaces protected by a carbon dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all other openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

§ 95.15–40 Pressure relief.

(a) Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

§ 95.15–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangments, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 95.15–5 through 95.15–40 insofar as is reasonable and practicable, with the exception of § 95.15–5(e) (1), (2) and (4) covering spaces other than cargo spaces, which systems may be installed in accordance with subparagraphs (3) through (6) of this paragraph.

(3) In boilerrooms, the bilges shall be protected by a system discharging principally below the floor plates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boilerroom taken to the top of the boilers divided by 36. In the event of an elevated boiler room which drains to the machinery space, the system shall be installed in the engineroom bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(4) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the under side of the deck forming the hatch opening divided by 22.

(5) In miscellaneous spaces other than cargo or main machinery spaces the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(6) Branch lines to the various spaces other than cargo and similar spaces shall be as noted in Table 95.15–90 (a) (6). This table is based on cylinders having discharge outlets and siphon tubes of ⅜ inch diameter.

TABLE 95.15–90(a)(6)

Number of cylinders		Nominal pipe size, inches
Over	Not over	
------	2	¼—standard.
2	4	¾—standard.
4	6	1—extra heavy.
6	12	1¼—extra heavy.
12	18	1½—extra heavy.
18	27	2—extra heavy.
27	39	2½—extra heavy.
39	60	3—extra heavy.
60	80	3½—extra heavy.
80	104	4—extra heavy.
104	165	5—extra heavy.

Subpart 95.17—Foam Extinguishing Systems, Details

§ 95.17–1 Application.

(a) Where a foam extinguishing system is installed, the provisions of this subpart, with the exception of § 95.17–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 95.17–90.

§ 95.17–5 Quantity of foam required.

(a) *Area protected.* (1) For machinery and similar spaces, the system shall be so designed and arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(2) Where an installation is made to protect an oil fired boiler installation on a flat which is open to or can drain to the lower engineroom or other space, both the flat and the lower space shall be protected simultaneously. The flat shall be fitted with suitable coamings on

all openings other than deck drains to properly restrain the oil and foam at that level. Other installations of a similar nature will be considered in a like manner.

(3) Where a system is installed to protect a tank, it shall be so designed and arranged as to spread a blanket of foam over the entire liquid surface of the tank within the range of usual trim. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(b) *Rate of application.* (1) For spaces other than tanks, the rate of discharge to foam outlets protecting the hazard shall be at least as set forth in this subparagraph.

(i) For chemical foam systems with stored "A" and "B" solutions, a total of at least 1.6 gallons per minute of the two solutions shall be discharged for each 10 square feet of area protected.

(ii) For other types of foam systems, the water rate to the dry powder generators or air foam production equipment shall be at least 1.6 gallons per minute for each 10 square feet of area protected.

(2) For tanks, the rate of discharge to foam outlets protecting the hazard shall be as set forth in subparagraph (1) of this paragraph, except that the value of 1 gallon per minute shall be substituted in both cases for the value of 1.6 gallons per minute.

(c) *Supply of foam producing material.* (1) There shall be provided a quantity of foam producing material sufficient to operate the equipment at the discharge rate specified in paragraph (b) of this section for a period of at least 3 minutes for spaces other than tanks, and for at least 5 minutes for tanks.

(d) *Separate supply of foam agent.* A separate supply of foam agent need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(e) *Water supply for required pumps.* Where pumps are required, the water supply shall be from outside the space protected and shall in no way be dependent upon power from the space protected.

§ 95.17–10 Controls.

(a) The foam agent, its container, and all controls and valves for the operation of the system shall be of an approved type.

(b) The foam agent container and all controls and valves for the operation of the system shall be outside the space protected and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be as convenient as practicable to one of the main escapes from the spaces protected, and shall be marked as required by § 97.37–13 of this subchapter. Where pumps are required, it shall not be necessary that they be started from the control space.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) The valves to the various spaces served shall be marked as required by § 97.37–10 of this subchapter.

§ 95.17–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall be used for no other purpose.

§ 95.17–20 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

§ 95.17–25 Additional protection required.

(a) In order that any residual fires above the floor plates may be extinguished when a foam system is installed for the protection of spaces other than tanks, at least 2 fire hydrants, in addition to those required for the machinery space by Subpart 95.10, shall be installed outside of the machinery space entrance. Such hydrants shall be fitted with sufficient hose so that any part of the machinery space may be reached with at least 2 streams of water, and each hose shall be equipped with an approved combination nozzle, applicator, and self-cleaning strainer as described in § 95.10–10 (i) (3).

§ 95.17–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 95.17–5 through 95.17–20, with the exception of § 95.17–5 (a) (2), insofar as is reasonable and practicable. A 6-inch blanket of foam in 5 minutes for tanks and 3 minutes for other spaces will be considered as meeting the requirements of § 95.17–5.

Subpart 95.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems; Arrangements and Details

§ 95.50–1 Application.

(a) The provisions of this subpart, with the exception of § 95.50–90, shall apply to all vessels, other than unmanned barges and fishing vessels, contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 95.50–90.

§ 95.50–5 Classification.

(a) Hand portable fire extinguishers and semiportable fire extinguishing systems shall be classified by a combination letter and number symbol. The letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) The types of fire will be designated as follows:

(1) "A" for fires in ordinary combustible materials where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water, are of first importance.

(2) "B" for fires in flammable liquids, greases, etc., where a blanketing effect is essential.

(3) "C" for fires in electrical equipment where the use of nonconducting extinguishing agent is of first importance.

(c) The number designations for size will start with "I" for the smallest to "V" for the largest. Sizes I and II are considered hand portable fire extinguishers and sizes III, IV, and V are considered semiportable fire extinguishing systems which shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be covered. Examples of size graduations for some of the typical hand portable and semiportable fire extinguishing systems are set forth in Table 95.50–5 (c).

TABLE 95.50-5 (c)

Classification		Soda-acid and water, gallons	Foam, gallons	Carbon dioxide, pounds	Dry chemical, pounds
Type	Size				
A	II	2½	2½		
B	I		1¼	4	2
B	II		2½	15	10
B	III		11	35	20
B	IV		20	80	30
B	V		40	100	50
C	I			4	2
C	II			15	10

(d) All hand portable fire extinguishers and semiportable fire extinguishing systems shall have permanently attached thereto a metallic name plate giving the name of the item, the rated capacity in gallons, quarts, or pounds, the name and address of the person or firm for whom approved, and the identifying mark of the actual manufacturer.

(e) Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels.

§ 95.50–10 Location.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed in accordance with Table 95.50–10(a). The location of the equipment shall be to the satisfaction of the Officer in Charge,

Marine Inspection. Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional equipment as he deems necessary for the proper protection of the vessel.

TABLE 95.50-10 (a)—HAND PORTABLE FIRE EXTINGUISHER AND SEMIPORTABLE FIRE-EXTINGUISHING SYSTEMS

Space	Classification (see § 95.50-5)	Quantity and location
Safety areas [1]		
Wheelhouse or fire control room		None required.
Stairway and elevator enclosures		Do.
Communicating corridors	A-II	1 in each main corridor not more than 150 feet apart. (May be located in stairways.)
Lifeboat embarkation and lowering stations		None required.
Radio room	C-I [2]	2 in vicinity of exit.[2]
Accommodations [1]		
Staterooms, toilet spaces, public spaces, offices, lockers, isolated storerooms, and pantries, open decks, etc.		None required.
Service spaces [1]		
Galleys	B-II or C-II	1 for each 2,500 square feet or fraction thereof suitable for hazards involved.
Paint and lamp rooms	B-II	1 outside space in vicinity of exit.
Accessible baggage, mail, and specie rooms, and storerooms.	A-II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, either inside or outside the spaces.
Carpenter shop and similar spaces	A-II	1 outside the space in vicinity of exit.
Machinery spaces		
Coal-fired boilers: Bunker and boiler space		None required.
Oil-fired boilers: Spaces containing oil-fired boilers, either main or auxiliary, or their fuel-oil units.	B-II B-V	2 required.[3] 1 required.[4]
Internal combustion or gas turbine propelling machinery spaces.	B-II B-III	1 for each 1,000 brake horsepower, but not less than 2 nor more than 6.[5] 1 required.[6 7]
Electric propulsive motors or generators of open type	C-II	1 for each propulsion motor or generator unit.
Enclosed ventilating systems for motors and generators of electric propelling machinery.		None required.
Auxiliary spaces:		
Internal combustion or gas turbine	B-II	1 outside the space in vicinity of exit.[7]
Electric emergency motors or generators	C-II	1 outside the space in vicinity of exit.[8]
Steam		None required.
Trunks to machinery spaces		Do.
Fuel tanks		Do.
Cargo spaces		
Inaccessible during voyage, including trunks and cargo tanks.		None required.
Accessible during voyage		Do.

[1] For motorboats, the total number of hand portable fire extinguishers required for safety areas, accommodation spaces, and service spaces shall be 1 B-II for motorboats of less than 50 gross tons and 2 B-II for motorboats of 50 gross tons and over. Two B-I hand portable fire extinguishers may be substituted for 1 B-II.
[2] For vessels on an international voyage, substitute 1 C-II in vicinity of exit.
[3] Vessels of less than 1,000 gross tons require 1.
[4] Vessels of less than 1,000 gross tons may substitute 1 B-IV.
[5] Only 1 required for motorboats.
[6] If oil burning donkey boiler fitted in space, the B-V previously required for the protection of the boiler may be substituted. Not required where a fixed carbon dioxide system is installed.
[7] Not required on vessels of less than 300 gross tons if fuel has a flashpoint higher than 110° F.
[8] Not required on vessels of less than 300 gross tons.

(b) Semiportable fire extinguishing systems shall be located in the open so as to be readily seen.

(c) If hand portable fire extinguishers are not located in the open or behind glass so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 97.37-15 of this subchapter.

(d) Hand portable fire extinguishers and their stations shall be numbered in accordance with § 97.37-23 of this subchapter.

(e) Hand portable or semiportable extinguishers, which are required on their nameplates to be protected from freezing, shall not be located where freezing temperatures may be expected.

§ 95.50-15 Spare charges.

(a) For all vessels other than motorboats spare charges shall be carried for at least 50 percent of each size and each variety, i.e. foam, soda-acid, carbon dioxide, etc., of hand portable fire extinguisher required by § 95.50-10(a). However, if the unit is of such variety that it cannot be readily recharged by the vessel's personnel, one spare unit of the same classification shall be carried in lieu of spare charges for all such units of the same size and variety.

(b) Spare charges shall be so packaged as to minimize the hazards to personnel while recharging the units. Acid shall be contained in a Crown stopper type of bottle.

§ 95.50-90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The provisions of §§ 95.50-5 through 95.50-15 shall be met with the exception that existing installations in safety areas and service spaces may be maintained if in the opinion of the Officer in Charge, Marine Inspection, they are in general agreement with the degree of safety prescribed by Table 95.50-10 (a). In such cases, minor modifications may be made to the same standard as the original installation: *Provided*, That in no case will a greater departure from the standards of Table 95.50-10 (a) be permitted than presently exists.

Subpart 95.60—Fire Axes

§ 95.60-1 Application.

(a) The provisions of this subpart shall apply to all vessels other than motorboats.

§ 95.60-5 Number required.

(a) All vessels except barges shall carry at least the minimum number of fire axes as set forth in Table 95.60-5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he deems necessary for the proper protection of the vessel.

TABLE 95.60-5 (a)

Gross tons		Number of axes
Over	Not over	
------	50	1
50	300	2
300	500	4
500	1,000	6
1,000	------	8

(b) Manned barges shall carry at least two fire axes.

§ 95.60-10 Location.

(a) Fire axes shall be distributed throughout the spaces available to persons on board so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open, or behind glass, so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 97.37-15 of this subchapter.

PART 96—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

Subpart 96.01—Application

Sec.
96.01-1 General.

Subpart 96.03—Marine Engineering Systems

96.03-1 Installation and details.

Subpart 96.05—Electrical Engineering and Interior Communications Systems

96.05-1 Installation and details.

Subpart 96.07—Anchors, Chains, and Hawsers

96.07-1 Application.
96.07-5 Ocean, coastwise, or Great Lakes service.
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96.07-90 Vessels contracted for prior to November 19, 1952.

Subpart 96.13—Radiotelegraph and Radiotelephone

96.13-1 Required by Federal Communications Commission.

Subpart 96.15—Radio Direction Finder

96.15-1 Application.
96.15-5 Required by Federal Communications Commission.

Sec.
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Subpart 96.17—Navigation Lights and Shapes

96.17-1 When required.

Subpart 96.20—Whistles

96.20-1 Vessels other than sailing vessels, barges, and motorboats.
96.20-5 Motorboats operating on the high seas.
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Subpart 96.23—Foghorns

96.23-1 Vessels other than motorboats.
96.23-5 Motorboats.

Subpart 96.25—Fog Sound Signal Devices

96.25-1 Vessels other than motorboats.
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Subpart 96.30—Protection from Refrigerants

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Subpart 96.35—Fireman's Outfit

96.35-1 Application.
96.35-5 General.
96.35-10 Fireman's outfit.
96.35-15 Stowage.
96.35-20 Spare charges.
96.35-90 Vessels contracted for prior to May 26, 1965.

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Subpart 96.01—Application

§ 96.01-1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

Subpart 96.03—Marine Engineering Systems

§ 96.03-1 Installation and details.

(a) The installation of all systems of a marine engineering nature, together with the details of design, construction, and installation, shall be in accordance with the requirements of Subchapter F (Marine Engineering) of this chapter. Systems of this type include the following:

Steering Systems.
Bilge and Ballast Systems.
Tank Vent and Sounding Systems.
Overboard Discharges and Shell Connections.
Pipe and Pressure Systems.
Liquefied Petroleum Gas For Cooking and Heating.

Subpart 96.05—Electrical Engineering and Interior Communications Systems

§ 96.05-1 Installation and details.

(a) The installation of all systems of an electrical engineering or interior communication nature, together with the details of design, construction, and installation, shall be in accordance with the requirements of Subchapter J (Electrical Engineering) of this chapter. Systems of this type include the following:

Ship's Service Lighting and Power Systems.
Emergency Lighting and Power Systems.
General Alarm Systems.
Sound Powered Telephone and Voice Tube Communication Systems.
Engine Order Telegraph Systems.
Rudder Angle Indicator Systems.
Refrigerated Spaces Alarm Systems.
Miscellaneous Machinery Alarms and Controls.
Daylight Signaling Lamps.

Subpart 96.07—Anchors, Chains, and Hawsers

§ 96.07-1 Application.

(a) The provisions of this subpart, with the exception of § 96.07-90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 96.07-90.

§ 96.07-5 Ocean, coastwise, or Great Lakes service.

(a) Vessels in ocean, coastwise, or Great Lakes service shall be fitted with anchors, chains, and hawsers in general agreement with the standards established by the American Bureau of Shipping, see Subpart 90.35 of this subchapter.

§ 96.07-10 Lakes, bays, and sounds, or river service.

(a) Vessels in lakes, bays and sounds, or river service shall be fitted with such ground tackle and hawsers as deemed necessary by the Officer in Charge, Marine Inspection, depending upon the size of the vessel and the waters on which it operates.

§ 96.07-90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Installations previously accepted or approved shall be considered satisfactory for the same service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. If the service of the vessel is changed, the suitability of the equipment will be established by the Officer in Charge, Marine Inspection.

Subpart 96.13—Radiotelegraph and Radiotelephone

§ 96.13-1 Required by Federal Communications Commission.

(a) Radiotelegraph and radiotelephone installations are required on certain vessels. Details of the application of this requirement as well as details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

Subpart 96.15—Radio Direction Finder

§ 96.15-1 Application.

(a) The provisions of this subpart, with the exception of § 96.15-90, shall apply to all mechanically propelled vessels of 1,600 gross tons and over in ocean service or on an international voyage contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 96.15-90.

§ 96.15-5 Required by Federal Communications Commission.

(a) All vessels shall be fitted with a radio direction finder. Details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

§ 96.15-90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Vessels of over 5,000 gross tons shall meet the requirements of § 96.15-5.

(2) Vessels of from 1,600 gross tons through 5,000 gross tons shall meet the requirements of § 96.15-5 on or before November 19, 1954.

Subpart 96.17—Navigation Lights and Shapes

§ 96.17-1 When required.

(a) All vessels and motorboats shall be equipped with navigation lights and shapes as prescribed by law and regulation.

Subpart 96.20—Whistles

§ 96.20-1 Vessels other than sailing vessels, barges, and motorboats.

(a) All vessels other than sailing vessels, barges, and motorboats, shall be equipped with an efficient whistle or similar appliance to give the necessary whistle signals required by the Rules of the Road applicable to the waters on which the vessel is navigated. The location of the whistle and operating devices shall be as follows:

(1) Means shall be provided to operate the whistle or other appliance from a position adjacent to the main steering station and from the steering station on top of the wheelhouse where such steering station is fitted. Details of the whistle operating device shall be as described in Subchapter J (Electrical Engineering) of this chapter.

(2) In general, the whistle shall be located on the forward side of or above the structure of the vessel so as to be as free of obstructions as possible. Where practicable, it shall be installed at least 6 feet above the wheelhouse, except that on vessels navigating the Western Rivers, and any vessel of less than 100 gross tons, it shall be at least 2 feet above the wheelhouse.

(3) On double ended ferry vessels and similar vessels, where steam whistles are employed, they shall be installed both forward and aft of the stacks or one such whistle on either the port or starboard side of the stack.

§ 96.20–5 Motorboats operating on the high seas.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for whistles or similar appliances prescribed by § 96.20–1 for vessels other than motorboats.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

§ 96.20–10 Motorboats operating on the navigable waters of the United States.

(a) Motorboats operating on the navigable waters of the United States shall be provided with an efficient whistle or other sound-producing mechanical device as set forth in Table 96.20–10 (a).

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

TABLE 96.20–10 (a)

Class of motorboat	Type of device
A	None.
1	Mouth, hand or power operated, capable of producing a blast of 2 seconds or more duration and audible for at least ½ mile.
II	Hand or power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.
II	Power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.

Subpart 96.23—Foghorns

§ 96.23–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be equipped with an efficient foghorn as prescribed by the Rules of the Road applicable to the waters on which the vessel is navigated. On vessels in ocean or coastwise service, the foghorn shall be sounded by mechanical means.

§ 96.23–5 Motorboats.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for foghorns prescribed by § 96.23–1 for vessels other than motorboats.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p.)

Subpart 96.25—Fog Sound Signal Devices

§ 96.25–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be provided with an efficient fog bell at least 8 inches in diameter. The fog bell shall be located where the sound will be least obstructed.

(b) All vessels of more than 350 feet in length shall be provided with a fog gong which will produce a sound easily distinguishable from the sound of the bell required by paragraph (a) and shall have a range of audibility approximating that of the bell. Vessels operating exclusively on the Great Lakes and the inland waters of the United States shall be exempt from this section.

§ 96.25–5 Motorboats operating on the high seas.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for fog bells prescribed by § 96.25–1 for vessels other than motorboats.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

§ 96.25–10 Motorboats operating on the navigable waters of the United States.

(a) When operating on the navigable waters of the United States, motorboats of Classes A and 1 are not required to carry fog bells. However, motorboats of Classes 2 and 3 operating on the navigable waters of the United States shall be provided with an efficient fog bell.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

Subpart 96.27—Sounding Equipment

§ 96.27–1 When required.

(a) All mechanically propelled vessels in ocean or coastwise service of 500 gross tons and over, and all mechanically propelled vessels in Great Lakes service of 1,500 gross tons and over, except paddle wheel vessels, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus in addition to the deep-sea hand leads. On Great Lakes vessels, a shallow water alarm may be substituted.

Subpart 96.30—Protection From Refrigerants

§ 96.30–1 Application.

(a) The provisions of this subpart, with the exception of § 96.30–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 96.30–90.

§ 96.30–5 General.

(a) All self-contained breathing apparatus and gas masks shall be of an approved type, constructed in accordance with Subpart 160.011 of Subchapter Q (Specifications) of this chapter.

(b) All equipment shall be maintained in an operative condition, and it shall be the responsibility of the master and chief engineer to ascertain that a sufficient number of the crew are familiar with the operation of the equipment.

§ 96.30–15 Refrigeration masks.

(a) On all vessels equipped with refrigeration, other than small unit type refrigerations of not more than 20 cubic feet capacity, a gas mask, suitable for protection against each refrigerant used, or a self-contained breathing apparatus shall be provided. The refrigeration gas masks shall be stowed convenient to, but outside of the spaces containing the refrigeration equipment.

(b) A complete recharge shall be carried for each gas mask and self-contained breathing apparatus. The spare charge shall be stowed in the same location as the equipment it is to reactivate.

§ 96.30–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The requirements of §§ 96.30–5 through 96.30–15 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications set forth in § 96.30–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, but all new installations or replacements shall meet the applicable specifications or requirements in this subpart.

Subpart 96.35— Fireman's Outfit

§ 96.35–1 Application.

(a) The provisions of this subpart, with the exception of § 96.35–90, shall apply to all vessels on an international voyage contracted for on or after May 26, 1965. Such vessels contracted for prior to May 26, 1965, shall meet the requirements of § 96.35–90.

§ 96.35–5 General.

(a) All flame safety lamps shall be of an approved type, constructed in accordance with Subpart 160.016 of Subchapter Q (Specifications) of this chapter.

(b) All self-contained breathing apparatus shall be of an approved type, constructed in accordance with Subpart 160.011 of Subchapter Q (Specifications) of this chapter.

(c) All flashlights shall be of an approved 3-cell explosion-proof type, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter.

(d) All lifelines shall be of steel or bronze wire rope. Steel wire rope shall be either inherently corrosion-resistant, or made so by galvanizing or tinning. Each end shall be fitted with a hook with keeper having throat opening which can be readily slipped over a ⅝-inch bolt. The total length of the lifeline shall be dependent upon the size and arrangement of the vessel, and more than one line may be hooked together to achieve the necessary length. No in-

dividual length of lifeline may be less than 50 feet in length. The assembled lifeline shall have a minimum breaking strength of 1,500 pounds.

(e) All equipment shall be maintained in an operative condition, and it shall be the responsibility of the master and chief engineer to ascertain that a sufficient number of the crew are familiar with the operation of the equipment.

§ 96.35–10 Fireman's outfit.

(a) A fireman's outfit shall consist of one self-contained breathing apparatus with lifeline attached, one flashlight, one flame safety lamp, and one fire ax.

(b) Every vessel shall carry at least one fireman's outfit.

§ 96.35–15 Stowage.

(a) Equipment shall be stowed in a convenient, accessible location as determined by the master, for use in case of emergency.

§ 96.35–20 Spare charges.

(a) A complete recharge shall be carried for each self-contained breathing apparatus, and a complete set of spare batteries shall be carried for each flashlight. The spares shall be stowed in the same location as the equipment it is to reactivate.

§ 96.35–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) The requirements of §§ 96.35–5 through 96.35–20 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications set forth in § 96.35–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, but all new installations or replacements shall meet the applicable specifications or requirements.

PART 97—OPERATIONS

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97.01–1 General.

Subpart 97.03—Statutory Penalties

97.03–1 General.

Subpart 97.05—Notice to Mariners and Aids to Navigation

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97.20–1 Unnecessary whistling prohibited.

Subpart 97.23—Unauthorized Lights

97.23–1 Unauthorized lights prohibited.

Subpart 97.25—Searchlights

97.25–1 Improper use prohibited.

Subpart 97.27—Lookouts

97.27–5 Master's and officer's responsibility.
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Subpart 97.75—Prevention of Oil Pollution

97.75–1 Prohibited zones.

AUTHORITY: The provisions of this Part 97 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 435, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659, unless otherwise noted.

Subpart 97.01—Application

§ 97.01–1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

Subpart 97.03—Statutory Penalties

§ 97.03–1 General.

(a) The marine safety and criminal statutes provide penalties for the violation of the applicable provisions of this subchapter, which penalties, depending upon the gravity of the violation, are as follows:

(1) Assessment and collection of civil monetary penalty.

(2) Criminal prosecution where no loss of life results.

(3) Criminal prosecution for manslaughter where loss of life results from violation of statute or regulation or from misconduct, negligence, or inattention to duty.

(4) Libel against vessel.

(b) In addition to the foregoing, any licensed or certificated personnel committing an act of misbehavior, negligence, unskillfulness, endangering life, violation of marine safety statutes or regulations or requirements thereunder, and incompetency shall be subject to proceedings under the provisions of 46 U. S. C. 239 and regulations thereunder (Part 137 of this chapter) with respect to suspension or revocation of license or certificate.

Subpart 97.05—Notice to Mariners and Aids to Navigation

§ 97.05–1 Duty of officers.

(a) Licensed deck officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation. Neglect to do so is evidence of neglect of duty. It is desirable that vessels other than motorboats shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(1) Notice to Mariners, published weekly by the Coast Guard, contains announcements and information regarding aids to navigation and charts of waters of the United States and is available for free distribution at field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse.

(2) Notice to Mariners, published weekly by the United States Navy for the correction of charts, sailing directions, light lists, and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Oceanographic Office, Branch Oceanographic Offices, or any of the agencies at seaboard ports, and is also on file in the United States consulates where they may be inspected.

§ 97.05–5 Charts.

(a) All vessels, except barges, vessels operating exclusively on rivers, and motorboats other than those certificated for ocean and coastwise routes, shall have charts of the waters upon which they operate available for convenient reference at all times.

Subpart 97.07—Notice of Casualty and Voyage Records

AUTHORITY: The provisions of this Subpart 97.07 interpret or apply R.S. 4450, as amended, 4453, as amended, secs. 13, 17, 54 Stat. 165, 166, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 435, 526*l*(c), 526p, 33 U.S.C. 361. Treasury Department Orders 167–32, Sept. 23, 1958, 23 F.R. 7605; 167–38, Oct. 26, 1959, 24 F.R. 8857.

§ 97.07–1 Notice of casualty.

(a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U.S. Coast Guard whenever the casualty results in any of the following:

(1) Damage to property in excess of $1,500.

(2) Material damage affecting the seaworthiness or efficiency of a vessel.

(3) Stranding or grounding.

(4) Loss of life.

(5) Injury causing any person to remain incapacitated for a period in excess of 72 hours; except injuries to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

(b) The master of any nuclear vessel shall immediately inform the Commandant in the event of any accident or casualty to the nuclear vessel which may lead to an environmental hazard. The master shall also immediately inform the competent governmental authority of the country in whose waters the vessel may be in, or whose waters the vessel approaches in a damaged condition.

§ 97.07–5 Information required.

(a) The notice required by § 97.07–1 shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property.

§ 97.07–10 Written report.

(a) In addition to the notice required by § 97.07–1, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival. However, if from a distance it may be inconvenient to report in person, it may be done in writing only. The written report required for personal accident shall be made on Form CG–924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG–2692.

(b) If filed without delay, the Form CG–924E or CG–2692 may also provide the notice required by § 97.07–1.

§ 97.07–15 Retention of records.

(a) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engineroom logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, storage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists. The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast Guard officer or employee for examination upon request.

§ 97.07–20 Aids to navigation.

(a) Whenever a vesel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection. No report on Form CG–2692 is required unless any of the results listed in § 97.07–1 (a) occur.

§ 97.07–25 Reports when state of war exists.

(a) During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

Subpart 97.10—Persons Allowed in Pilothouse and on Navigation Bridge

§ 97.10–1 Application.

(a) The provisions of this subpart shall apply to all vessels carrying passengers.

§ 97.10–5 Persons excluded.

(a) Masters and pilots shall exclude from the pilothouse and navigator's bridge while under way, all persons not connected with the navigation of the vessel. However, inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the Coast Guard, United States Navy, United States Coast and Geodetic Survey, and the Engineer Department of the United States Army, or Maritime Administration personnel, may be allowed in the pilothouse or upon the navigator's bridge upon the responsibility of the officer in charge.

Subpart 97.12—Cargo Stowage

§ 97.12–1 Bulk ores and similar cargoes.

(a) The owners or operators of general cargo vessels which carry bulk cargoes such as ore, ore concentrates, and similar cargoes shall furnish to the masters of such vessels guidance information pertaining to the safe stowage of such cargoes.

§ 97.12–5 Manual.

(a) The manual on the "Stowage of Bulk Cargoes Such as Ore, Ore Concentrates, and Similar Cargoes when carried in General Cargo Vessels," 1959,[1] printed and distributed by the National Cargo Bureau, Inc., 99 John Street, New York, N.Y., 10038, is endorsed and recognized by the Coast Guard for use in compliance with the requirements of § 97.12–1(a).

Subpart 97.13—Station Bills

AUTHORITY: The provisions of this Subpart 97.13 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.13–1 Application.

(a) The provisions of this subpart shall apply to all vessels of over 500 gross tons except barges.

§ 97.13–5 Master's responsibility.

(a) A station bill (muster list) shall be prepared by the master of the vessel who shall be responsible to sign such station bill and to ascertain that it is duly posted in conspicuous locations in the vessel, particularly in the crew quarters, before the vessel sails.

§ 97.13–10 Duties of crew.

(a) The station bill shall set forth the special duties and duty station of each member of the crew for the various emergencies. The duties shall, as far as possible, be comparable with the regular work of the individual. The duties shall in general include the following and in addition, such other duties shall be assigned as are necessary in the case of the particular vessel for the proper handling of the particular emergency:

(1) The closing of airports, watertight doors, scuppers, sanitary and other discharges which lead through the vessel's hull below the margin line, etc., the stopping of fans and ventilating systems, and the operation of all safety equipment.

(2) The preparation and launching of lifeboats and liferafts.

(3) The extinction of fire.

(4) The muster of passengers, if carried, which shall in general be assigned to the stewards department, and shall include the following:

(i) Warning the passengers.

(ii) Seeing that they are dressed and have put on their life preservers in a proper manner.

(iii) Assembling the passengers and directing them to the appointed stations.

(iv) Keeping order in the passageways and stairways and generally controlling the movement of the passengers.

(v) Seeing that a supply of blankets is taken to the lifeboats.

(5) The custody of the portable radio apparatus required by Subpart 94.55 of this subchapter.

§ 97.13–15 Emergency signals.

(a) The station bill shall set forth the various signals to be used for the calling of the crew to their stations and for giving instructions while at their stations. These signals shall be as set forth in this section.

(b) (1) The fire alarm signal shall be a continuous blast of the whistle for a period of not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds.

(2) For dismissal from fire alarm stations, the general alarm shall be sounded three times supplemented by three short blasts of the whistle.

(c) (1) The signal for boat stations or boat drill shall be a succession of more than six short blasts followed by one long blast of the whistle supplemented by a comparable signal on the general alarm bells.

(2) Where whistle signals are used for handling the lifeboats, they shall be as follows:

(i) To lower lifeboats, one short blast.

(ii) To stop lowering the lifeboats, two short blasts.

(3) For dismissal from boat stations, there shall be three short blasts of the whistle.

(d) In the case of river vessels, the ship's bell may be used in lieu of the whistle signals stipulated in this section.

(e) The master of any vessel may establish such other emergency signals, in addition to the above, as will provide that all officers, crew, and passengers will have positive and certain notice of the existing emergency.

§ 97.13–20 Master to instruct crew.

(a) The master shall conduct such drills and give such instructions as are necessary to insure that all hands are familiar with their duties as specified in the station bill.

Subpart 97.14—Manning of Lifeboats and Liferafts

AUTHORITY: The provisions of this Subpart 97.14 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.14–1 Application.

(a) The provisions of this subpart shall apply to all vessels equipped with lifeboats and/or liferafts, except unmanned barges.

§ 97.14–5 Person in command of lifeboat or liferaft.

(a) For vessels in ocean service, the master shall appoint a first and second in command of each lifeboat and each liferaft who shall be either a licensed deck officer, an able seaman, or a certificated lifeboatman.

(b) For vessels in services other than ocean service, the master shall appoint a person in command of each lifeboat and each liferaft. Except for vessels in river service, this person in command shall be either a licensed deck officer, an able seaman, or a certificated lifeboatman.

(c) The person in charge of each lifeboat or liferaft shall have a list of its crew, and shall see that the persons under his orders are acquainted with their several duties.

§ 97.14–10 Certificated lifeboatmen.

(a) Except for vessels in river service, there shall be for each lifeboat and each liferaft a number of certificated lifeboatmen equal to that specified in Table 97.14–10(a): *Provided*, That vessels required to carry sufficient lifeboats on each side to accommodate all persons on board need only carry the certificated lifeboatmen required for the manning of the lifeboats on one side.

TABLE 97.14–10(a)

Prescribed complement of lifeboat or liferaft		Minimum number of lifeboatmen	
Over	Not over	Ocean service	All services other than ocean[1]
----------	25	2	1
25	40	2	2
40	60	3	3
60	85	4	4
85	110	5	5
110	----------	6	6

[1] Certificated lifeboatmen are not required on vessels in river service.

(b) The allocation of the certificated lifeboatmen to each lifeboat and each liferaft shall be at the discretion of the master according to the circumstances.

§ 97.14–15 Motor-propelled lifeboat.

(a) The master shall assign to each motor-propelled lifeboat a man capable of working the motor.

§ 97.14–20 Lifeboat carrying a wireless and/or searchlight.

(a) The master shall assign to each lifeboat carrying a wireless and/or

[1] A copy of this manual has been filed with the Office of the Federal Register. Copies are also on file with the various Coast Guard District Commanders for reference purposes.

searchlight a man capable of operating such equipment.

Subpart 97.15—Tests, Drills, and Inspections

AUTHORITY: The provisions of this Subpart 97.15 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857.

§ 97.15-1 Application.

(a) Except as specifically noted, the provisions of this subpart shall apply to all vessels other than motorboats, and to all motorboats on an international voyage. Motorboats not on an international voyage shall meet the general intent of this subpart insofar as is reasonable and practicable with the exception that the logging of information is not required.

§ 97.15-3 Steering gear, whistle, and means of communication.

(a) On all vessels making a voyage of more than 48 hours' duration, the entire steering gear, the whistle, and the means of communication between the bridge or pilothouse and the engineroom shall be examined and tested by an officer of the vessel within a period of not more than 12 hours prior to departure. On all other vessels similar examinations and tests shall be made at least once in every week.

(b) The date of the test and the condition of the equipment shall be noted in the official logbook.

§ 97.15-5 Drafts and load line markings.

(a) The master of every vessel on an ocean, coastwise, or Great Lakes voyage shall enter the drafts of the vessel, forward and aft, in the official logbook when leaving port.

(b) On vessels subject to the requirements of Subchapter E (Load Lines) of this chapter at the time of departure from port on an ocean, coastwise, or Great Lakes voyage, the master shall insert in the official logbook a statement of the position of the load line mark, port and starboard, in relation to the surface of the water in which the vessel is then floating.

(1) When an allowance for draft is made for density of the water in which the vessel is floating, this density is to be noted in the official logbook.

§ 97.15-10 Sanitation.

(a) It shall be the duty of the master and chief engineer to see that the vessel, and, in particular, the quarters are in a clean and sanitary condition. The chief engineer shall be responsible only for the sanitary condition of the engineering department.

§ 97.15-15 Examination of boilers and machinery.

(a) It shall be the duty of the chief engineer when he assumes charge of the boilers and machinery of a vessel to examine them thoroughly. If any parts thereof are in bad condition, or if the safety-valve seals are broken, the fact shall immediately be reported to the master, owner or agent, and the Officer in Charge, Marine Inspection.

§ 97.15-20 Hatches and other openings.

(a) (1) With the exception stated in subparagraph (2) of this paragraph, it shall be the responsibility of the master to assure himself that all exposed cargo hatches and other openings in the hull of his vessel are closed, made properly watertight by the use of tarpaulins, gaskets or similar devices, and in all respects properly secured for sea before leaving protected waters.

(2) A vessel engaged in a voyage exclusively on Great Lakes waters and having 6 feet or more of freeboard, measured vertically from the water's edge at the lowest point of sheer to the top of deck at the ship's side, may, at the master's discretion, omit tarpaulins on the ship's hatches from 16 May through 15 September (both dates inclusive). This exemption does not relieve the master of any responsibility for the securing and protection of his hatches during the interval of exemption and, in case of indications of bad weather or other threatening conditions, he shall not leave protected waters until the exposed cargo hatches and other openings in the hull of his vessel are properly covered, secured and protected.

(b) The openings to which this section applies are as follows:

(1) Exposed cargo hatches.

(2) Gangway, cargo and coaling ports fitted below the freeboard deck.

(3) Port lights that are not accessible during navigation including the dead lights for such port lights.

(c) Vessels which, by their design, do not require cargo hatch closing devices and to which § 45.01-20 of Subchapter E (Load Lines) of this chapter applies need not comply with the requirements of this section as to exposed cargo hatches.

(d) The master at his discretion may permit hatches or other openings to remain uncovered or open, or to be uncovered or opened for reasonable purposes such as ship's maintenance while the vessel is being navigated: *Provided*, That in his opinion existing conditions warrant such action.

(e) In the event the master employs the discretionary provisions of this section after leaving port he shall cause appropriate entries to be made in the official log or equivalent thereof setting forth the time of uncovering, opening, closing or covering of the hatches or other openings to which this section applies and the circumstances warranting the action taken.

(f) The discretionary provisions of this section shall not relieve the master of his responsibility for the safety of his vessel, her crew or cargo.

§ 97.15-25 Line-throwing appliances.

(a) On vessels fitted with a line-throwing appliance, it shall be the duty of the master to drill his crew in the use of such appliance, and require it to be fired at least once in every 3 months. Each drill shall be recorded in the vessel's official logbook. The service line shall not be used for drill purpose. The drill shall be conducted as follows:

(1) For impulse-projected rocket type, by actually firing the rocket with any flexible line of proper size and length, suitably faked or laid out.

(2) For shoulder gun type, by actually firing, using the regular cartridge and projectile with any flexible line of proper size and length, suitably faked or laid out.

(3) For Lyle gun type, by actually firing, using 2½ ounces of powder, the regular service projectile with any flexible line of proper size and length suitably faked or laid out.

§ 97.15-30 Emergency lighting and power systems.

(a) Where fitted, it shall be the duty of the master to see that the emergency lighting and power systems are operated and inspected at least once in each week that the vessel is navigated to be assured that the system is in proper operating condition.

(b) Internal combustion engine driven emergency generators shall be operated under load for at least 2 hours, at least once in each month that the vessel is navigated.

(c) Storage batteries for emergency lighting and power systems shall be tested at least once in each 6-month period that the vessel is navigated to demonstrate the ability of the storage battery to supply the emergency loads for the specified period of time.

(d) The date of the tests and the condition and performance of the apparatus shall be noted in the official log book.

§ 97.15-35 Fire and boat drills.

(a) The master shall be responsible for conducting a fire and boat drill at least once in every week. The scheduling of such drills shall be at the discretion of the Master except that at least one fire and boat drill shall be held within 24 hours of leaving a port if more than 25 percent of the crew have been replaced at that port.

(b) The fire and boat drill shall be conducted as if an actual emergency existed. All hands should report to their respective stations and be prepared to perform the duties specified in the station bill.

(1) Fire pumps shall be started and a sufficient number of outlets used to ascertain that the system is in proper working order.

(2) All rescue and safety equipment shall be brought from the emergency equipment lockers and the persons designated shall demonstrate their ability to use the equipment.

(3) All watertight doors which are in use while the vessel is under way shall be operated.

(4) Weather permitting, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position, painters led forward and tended, and other life-saving equipment prepared for use. The motor and hand-propelling gear of each lifeboat, where fitted, shall be operated for at least 5 minutes.

(5) The passengers, if carried, shall be encouraged to fully participate in

these drills and shall be instructed in the use of the life preservers.

(6) In port, every lifeboat shall be swung out, if practicable, and the unobstructed lifeboats shall be lowered to the water and the crew exercised in the use of the oars and other means of propulsion if provided for the lifeboat. Although all lifeboats may not be used in a particular drill, care shall be taken that all lifeboats are given occasional use to ascertain that all lowering equipment is in proper order and the crew properly trained. The Master shall be responsible that each lifeboat is lowered to the water at least once in each 3 months.

(7) When the vessel is under way, and weather permitting, all lifeboats shall be swung out to ascertain that the gear is in proper order.

(8) The person in charge of each lifeboat and liferaft shall have a list of its crew and shall see that the men under his command are acquainted with their duties.

(9) Lifeboat equipment shall be examined at least once a month to insure that it is complete.

(c) An entry shall be made in the vessel's official logbook relative to each fire and boat drill setting forth the date and hour, length of time of the drill, numbers on the lifeboats swung out and numbers on those lowered, the length of time that motor and hand-propelled lifeboats are operated, the number of lengths of hose used, together with a statement as to the condition of all fire and lifesaving equipment, watertight door mechanisms, valves, etc. An entry shall also be made to report the monthly examination of the lifeboat equipment. If in any week the required fire and boat drills are not held or only partial drills are held, an entry shall be made stating the circumstances and extent of the drills held.

(d) A copy of these requirements, Form CG-809, shall be framed under glass and posted in a conspicuous place about the vessel. This form may be obtained from the Officer in Charge, Marine Inspection.

§ 97.15-40 Electric power operated lifeboat winches.

(a) It shall be the duty of the master to see that all lifeboat winch control apparatus, including motor controllers, emergency switches, master switches, and limit switches, are examined at least once in each 3 months. The examination shall include the removal of drain plugs and/or the opening of drain valves in such appliances to assure that the enclosures are free of water.

(b) The date of the examination required by this section and the condition of the equipment shall be noted in the official logbook.

§ 97.15-45 Lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus.

(a) (1) It shall be the duty of the master or person in charge to see that the lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are properly maintained at all times, and that all equipment for his vessel required by the regulations in this subchapter is provided, maintained, and replaced as indicated.

(2) The master shall assign to one or more officers the duty of seeing that the lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are at all times ready for immediate use.

(3) The decks on which lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are stowed shall be kept clear of cargo or any other obstructions which would interfere with the immediate launching of such equipment.

(b) Where motor-propelled lifeboats are carried, the motor of each lifeboat shall be operated in the ahead and astern position for a period of not less than 5 minutes at least once in each week.

(c) All lifeboats, rescue boats and rigid type liferafts shall be stripped, cleaned, and thoroughly overhauled at least once in every year. When lifeboats are removed from a vessel for this purpose on a rotational basis, the installation test prescribed by Subpart 94.35 of this subchapter need not be made.

(d) The fuel tanks of all motor-propelled lifeboats shall be emptied and the fuel changed at least once in every year.

(e) Vessels in ocean or coastwise service having a sufficient number of lifeboats on each side to accommodate all persons on board may care for their lifeboats at sea: *Provided*, That a number of lifeboats sufficient to accommodate all persons on board are fully equipped and ready for use at all times.

(f) Inflatable liferafts shall be serviced at an approved service facility every 12 months or not later than the next inspection for certification provided the time since date of last servicing does not exceed 15 months. Except in emergencies no servicing should be done aboard vessels.

§ 97.15-50 Radio apparatus for lifeboats.

(a) It shall be the duty of the master to require that all batteries for all fixed and portable radio apparatus for lifeboats are brought up to full charge weekly if the batteries are of a type which require recharging.

(b) In any case, the transmitter shall be tested weekly using a suitable artificial aerial.

§ 97.15-55 Requirements for fuel oil.

(a) It shall be the duty of the chief engineer to cause an entry in the log to be made of each supply of fuel oil received on board, stating the quantity received, the name of the vendor, the name of the oil producer, and the flash point (closed cup test) for which it is certified by the producer.

(b) It shall be the further duty of the chief engineer to cause to be drawn and sealed and suitably labeled at the time the supply is received on board, a half-pint sample of each lot of fuel oil. These samples shall be preserved until the particular supply of oil is exhausted.

§ 97.15-60 Firefighting equipment, general.

(a) It shall be the duty of the owner, master, or person in charge to see that the vessel's firefighting equipment is at all times ready for use and that all such equipment required by the regulations in this subchapter is provided, maintained, and replaced as indicated.

(b) It shall be the duty of the owner, master, or person in charge to require and have performed at least once in every twelve months the tests and inspections of all hand portable fire extinguishers, semiportable fire extinguishing systems, and fixed fire extinguishing systems on board, as described in Tables 91.25-20 (a) (1) and 91.25-20(a) (2) in § 91.25-20 of this subchapter. The owner, master, or person in charge shall keep records of such tests and inspections showing the dates when performed, the number and/or other identification of each unit tested and inspected, and the name(s) of the person(s) and/or company conducting the tests and inspections. Such records shall be made available to the inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable these records should be kept in or with the vessel's log book. The conduct of these tests and inspections does not relieve the owner, master, or person in charge of his responsibility to maintain this firefighting equipment in proper condition at all times.

Subpart 97.17—Steering Orders

§ 97.17-1 Method of communicating.

(a) All steering orders shall be given and communicated in terms of "right rudder" where it is intended that the top of the wheel, the rudder blade, and the head of the ship should go to the right, and "left rudder" where it is intended that the top of the wheel, the rudder blade, and the head of the ship should go to the left.

Subpart 97.20—Whistling

§ 97.20-1 Unnecessary whistling prohibited.

(a) The unnecessary sounding of the vessel's whistle is prohibited within any harbor limits of the United States.

Subpart 97.23—Unauthorized Lights

§ 97.23-1 Unauthorized lights prohibited.

(a) The master shall not authorize or permit the carrying of any lights not required by law that in any way will interfere with the distinguishing of the signal lights.

Subpart 97.25—Searchlights

§ 97.25-1 Improper use prohibited.

(a) No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way.

Subpart 97.27—Lookouts

§ 97.27–5 Master's and officer's responsibility.

(a) Nothing in this part shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or to maintain a proper fire watch or from any neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case. When circumstances require it, additional watches shall be maintained to guard against fire or other danger and to give an alarm in case of accident or disaster.

§ 97.27–10 Reckless or negligent operation prohibited by law.

(a) Subsection 13(a) of the act of April 25, 1940 (46 U.S.C. 526*l*), reads as follows:

No person shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person. To "operate" means to navigate or otherwise use a motorboat or a vessel.

Subpart 97.30—Reports of Accidents, Repairs, and Unsafe Equipment

AUTHORITY: The provisions of this Subpart 97.30 interpret or apply R.S. 4450, as amended, 4453, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 435, 33 U.S.C. 361.

§ 97.30–1 Repairs to boilers and pressure vessels.

(a) Before making any repairs to boilers or unfired pressure vessels, the chief engineer shall submit a report covering the nature of the repairs to the Officer in Charge, Marine Inspection, at or nearest to the port where the repairs are to be made.

§ 97.30–5 Accidents to machinery.

(a) In the event of an accident to a boiler, unfired pressure vessel, or machinery tending to render the further use of the item unsafe until repairs are made, or if by ordinary wear such items become unsafe, a report shall be made, by the chief engineer immediately to the Officer in Charge, Marine Inspection, or if at sea immediately upon arrival at port.

§ 97.30–10 Notice required before repair.

(a) No repairs or alterations, except in an emergency, shall be made to any lifesaving or fire detecting or extinguishing equipment without advance notice to the Officer in Charge, Marine Inspection. When emergency repairs or alterations have been made, notice shall be given to the Officer in Charge, Marine Inspection, as soon as practicable.

§ 97.30–20 Breaking of safety valve seal.

(a) If at any time it is necessary to break the seal on a safety valve for any purpose, the chief engineer shall advise the Officer in Charge, Marine Inspection, at the next port of call, giving the reason for breaking the seal and requesting that the valve be examined and adjusted by an inspector.

(R.S. 4419, as amended; 46 U.S.C. 393)

Subpart 97.33—Cable Traveler

AUTHORITY: The provisions of this Subpart 97.33 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, Oct. 26, 1959, 24 F.R. 8857.

§ 97.33–1 When required.

(a) On vessels where the distance between deck houses is more than 150 feet, a wire cable shall be stretched between the deck houses at all times when the vessel is navigating in other than protected waters. As many loose rings with lanyards shall be attached as deemed necessary by the master. In any case, a properly constructed raised catwalk or raised bridge or a below deck passage may be substituted for the required cable.

Subpart 97.34—Work Vests

AUTHORITY: The provisions of this Subpart 97.34 interpret or apply R.S. 4488, as amended, 4491, as amended; 46 U.S.C. 481, 489. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.34–1 Application.

(a) Provisions of this subpart shall apply to all vessels inspected and certificated in accordance with this subchapter.

§ 97.34–5 Approved unicellular plastic foam work vests.

(a) Buoyant work vests carried under the permissive authority of this subpart shall conform to the specifications contained in Subpart 160.053 in Subchapter Q (Specifications) of this chapter.

§ 97.34–10 Use.

(a) Approved buoyant work vests are considered to be items of safety apparel and may be carried aboard vessels to be worn by crew members when working near or over the water under favorable working conditions. They shall be used under the supervision and control of designated ship's officers. When carried, such vests shall not be accepted in lieu of any portion of the required number of approved life preservers and shall not be substituted for the approved life preservers required to be worn during drills and emergencies.

§ 97.34–15 Shipboard stowage.

(a) The approved buoyant work vests shall be stowed separately from the regular stowage of approved life preservers.

(b) The locations for the stowage of work vests shall be such as not to be easily confused with that for approved life preservers.

§ 97.34–20 Shipboard inspections.

(a) Each work vest shall be subject to examination by a marine inspector to determine its serviceability. If found to be satisfactory, it may be continued in service, but shall not be stamped by a marine inspector with a Coast Guard stamp. If a work vest is found not to be in a serviceable condition, then such work vest shall be removed from the vessel. If a work vest is beyond repair, it shall be destroyed or mutilated in the presence of a marine inspector so as to prevent its continued use as a work vest.

Subpart 97.35—Logbook Entries

§ 97.35–1 Application.

(a) Except as specifically noted, the provisions of this subpart shall apply to all vessels other than motorboats and barges. Motorboats on an international or intercoastal voyage may be required to carry a logbook in accordance with § 97.35–10.

§ 97.35–3 Logbooks and records.

(a) Under various statutes or by regulations in this subchapter, vessels engaged in all trades, with the exception of vessels engaged exclusively in trade on rivers of the United States shall have certain logbooks or records, and, when the occasion arises, it is the duty of the master or person in charge to place therein specific entries as required by law or regulations in this chapter.

(b) R.S. 4290, as amended (46 U.S.C. 201), states: "Every vessel making voyages from a port in the United States to any foreign port, or, being of the burden of 75 tons or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an Official Logbook; * * *." This Official Logbook is furnished gratuitously to masters of United States' flag vessels by the Coast Guard, as Form CG–706B or CG–706C, depending upon the number of persons employed as crew. There is printed in the first several pages of this Official Logbook various acts of Congress relating to logbooks and the entries required to be made therein. When a voyage is completed, or after a specified period of time is completed, the Official Logbooks with required entries therein shall be filed with the Officer in Charge, Marine Inspection, at or nearest the port where the vessel may be.

(c) For vessels other than those required to have Official Logbooks by R.S. 4290, the owners, operators, and/or masters are to supply their own logs or records in any form desired, which will be considered to take the place of the Official Logbooks and may be used for the purpose of making entries therein as required by law or regulations in this subchapter. Such logs or records are not filed with the Officer in Charge, Marine Inspection, but shall be kept available for review by a marine inspector for a period of one year after the date to which the records refer, except for separate records of tests and inspections of firefighting equipment which shall be maintained with the vessel's logs for the period of validity of the vessel's certificate of inspection.

§ 97.35–5 Actions required to be logged.

(a) The actions and observations noted in this section shall be entered in the official log book. This section contains no requirements which are not

made in other portions of this subchapter, the items being merely grouped together for convenience.

(1) Fire and Boat Drills. Weekly. See § 97.15–35.

(2) Steering Gear, Whistle, and Means of Communication. Prior to departure. See § 97.15–3.

(3) Drafts and Load Line Markings. Prior to leaving port, ocean, coastwise, and Great Lakes services only. See § 97.15–5.

(4) Hatches and other openings. All openings and closings, or leaving port without closing. Except vessels on protected waters. See § 97.15–20.

(5) Line Throwing Appliances. Once every 3 months. See § 97.15–25.

(6) Emergency Lighting and Power Systems. Weekly and semi-annually. See § 97.15–30.

(7) Electric Power Operated Lifeboat Winches. Once every 3 months. See § 97.15–40.

(8) Fuel oil data: Upon receipt of fuel oil on board. See § 97.15–55.

(9) Cargo gear inspections: At least once a month. See § 91.37–70 of this subchapter.

§ 97.35–10 Official log entries.

(a) On vessels where an Official Logbook is required by R.S. 4290 (46 U.S.C. 201), all items relative to the crew and passengers, as well as with respect to any casualties which may occur, shall be entered in the Official Logbook as required by this law.

Subpart 97.36—Display of Plans

§ 97.36–1 When required.

(a) Barges with sleeping accommodations for more than six persons and all self-propelled vessels shall have permanently exhibited for the guidance of the officer in charge of the vessel, general arrangement plans showing for each deck the various fire retardant bulkheads together with particulars of the fire detecting, manual alarm and fire extinguishing systems, fire doors, means of ingress to the different compartments, and the ventilating systems including the positions of the dampers, the location of the remote means of stopping the fans, and the identification of the fans serving each section.

(R.S. 4488, as amended, 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857)

Subpart 97.37—Markings for Fire and Emergency Equipment, Etc.

AUTHORITY: The provisions of this Subpart 97.37 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.37–1 Application.

(a) The provisions of this subpart, with the exception of § 97.37–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 97.37–90.

§ 97.37–3 General.

(a) It is the intent of this subpart to provide such markings as are necessary for the guidance of the persons on board in case of an emergency. In any specific case, and particularly on small vessels, where it can be shown to the satisfaction of the Officer in Charge, Marine Inspection, that the prescribed markings are unnecessary for the guidance of the persons on board in case of emergency, such markings may be modified or omitted.

(b) In addition to English, all stateroom notices, directional signs, etc., shall be printed in languages appropriate to the service of the vessel or other action be taken to achieve the same purpose.

(c) Where in this subpart red letters are specified, letters of a contrasting color on a red background will be accepted.

§ 97.37–5 General alarm bell switch.

(a) The general alarm bell switch in the pilothouse shall be clearly and permanently identified by lettering on a metal plate or with a sign in red letters on a suitable background: "GENERAL ALARM."

CROSS REFERENCE: See also § 113.25–20 of Subchapter J (Electrical Engineering) of this chapter.

§ 97.37–7 General alarm bells.

(a) All general alarm bells shall be identified by red lettering at least ½ inch high: "GENERAL ALARM—WHEN BELL RINGS GO TO YOUR STATION."

§ 97.37–9 Carbon dioxide alarm.

(a) All carbon dioxide alarms shall be conspicuously identified: "WHEN ALARM SOUNDS—VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

§ 97.37–10 Fire extinguishing system branch lines.

(a) The branch line valves of all fire extinguishing systems shall be plainly and permanently marked indicating the spaces served.

§ 97.37–13 Fire extinguishing system controls.

(a) The control cabinets or spaces containing valves or manifolds for the various fire extinguishing systems shall be distinctly marked in conspicuous red letters at least 2 inches high: "STEAM FIRE APPARATUS," "CARBON DIOXIDE FIRE APPARATUS," "FOAM FIRE APPARATUS," or "WATER SPRAY FIRE APPARATUS" as the case may be.

§ 97.37–15 Fire hose stations.

(a) Each fire hydrant shall be identified in red letters and figures at least two inches high "FIRE STATION NO. 1," "2," "3," etc. Where the hose is not stowed in the open or behind glass so as to be readily seen, this identification shall be so placed as to be readily seen from a distance.

§ 97.37–20 Self-contained breathing apparatus and gas masks.

(a) Lockers or spaces containing self-contained breathing apparatus shall be marked "SELF-CONTAINED BREATHING APPARATUS."

§ 97.37–23 Hand portable fire extinguishers.

(a) Each hand portable fire extinguisher shall be marked with a number and the location where stowed shall be marked with a corresponding number at least ½ inch high. Where only one type and size of hand portable fire extinguisher is carried, the numbering may be omitted.

§ 97.37–25 Emergency lights.

(a) All emergency lights shall be marked with a letter "E" at least ½ inch high.

§ 97.37–33 Instructions for changing steering gear.

(a) Instructions in at least ½ inch letters and figures shall be posted in the steering engine room, relating in order, the different steps to be taken in changing to the emergency steering gear. Each clutch, gear, wheel, lever, valve, or switch which is used during the change-over shall be numbered or lettered on a metal plate or painted so that the markings can be recognized at a reasonable distance. The instructions shall indicate each clutch or pin to be "in" or "out" and each valve or switch which is to be "opened" or "closed" in shifting to any means of steering for which the vessel is equipped. Instructions shall be included to line up all steering wheels and rudder amidship before changing gears.

§ 97.37–35 Rudder orders.

(a) At all steering stations, there shall be installed a suitable notice on the wheel or device or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder."

§ 97.37–37 Lifeboats.

(a) The name of the vessel shall be plainly marked or painted on each side of the bow of each lifeboat in letters not less than 3 inches high. For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters.

(b) The number of each lifeboat shall be plainly marked or painted on each side of the bow of each lifeboat in figures not less than 3 inches high. The lifeboats on each side of the vessel shall be numbered from forward aft, with the odd numbers on the starboard side.

(c) The cubical contents and number of persons allowed to be carried in each lifeboat shall be plainly marked or painted on each side of the bow of each lifeboat in letters and numbers not less than 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on top of at

least 2 thwarts in letters and numbers not less than 3 inches high.

(d) All oars shall be conspicuously marked with the vessel's name.

(e) Where mechanical disengaging apparatus is used, the control effecting the release of the lifeboat shall be painted bright red and shall have thereon in raised letters either the words—"DANGER-LEVER DROPS BOAT", or the words—"DANGER—LEVER RELEASES HOOKS".

(f) The top of thwarts, side benches and footings of lifeboats shall be painted or otherwise colored international orange. The area in way of the red mechanical disengaging gear control lever, from the keel to the side bench, shall be painted or otherwise colored white, to provide a contrasting background for the lever. This band of white should be approximately 12 inches wide depending on the internal arrangements of the lifeboat.

§ 97.37–40 Liferafts, lifefloats and buoyant apparatus.

(a) Rigid type liferafts, lifefloats, and buoyant apparatus, together with their oars and paddles, shall be conspicuously marked with the vessel's name. For vessels on an international voyage, the vessel's port of registry also shall be similarly marked on lifefloats and buoyant apparatus.

(b) The number of persons allowed on each rigid type liferaft, lifeboat, and buoyant apparatus shall be conspicuously marked or painted thereon in letters and numbers at least 1½ inches high.

(c) There shall be stenciled in a conspicuous place in the immediate vicinity of each inflatable liferaft the following:

INFLATABLE LIFERAFT NO. ----------
---------- PERSONS CAPACITY

These markings shall not be placed on the inflatable life raft containers.

NOTE: § 160.051–8(a) of Subchapter Q (Specifications) of this chapter requires permanently attached name plates of each inflatable liferaft and carrying case. The name plate contains the following information: The name of manufacturer, approval number, the manufacturer's model number, serial number, and lot number, and the number of persons for which the inflatable life raft is approved. In addition, the carrying case shall be marked "Ocean Service Equipment" or "Limited Service Equipment," as applicable, together with the marine inspector's initials, the date, and the letters "USCG."

§ 97.37–43 Life preservers and ring life buoys.

(a) All life preservers, wood floats, and ring life buoys shall be marked with the vessel's name.

(b) For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters on all ring life buoys.

§ 97.37–45 Fire hose and axes.

(a) All fire hose and axes shall be marked with the vessel's name.

§ 97.37–47 Portable magazine chests.

(a) Portable magazine chests shall be marked in letters at least 3 inches high: "PORTABLE MAGAZINE CHEST—FLAMMABLE—KEEP LIGHTS AND FIRE AWAY."

§ 97.37–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) The requirements of §§ 97.37–5 through 97.37–47 shall be met with the exception that existing signs and markings containing the same general intent, but not necessarily identical wording or exact letter type, size, or color, may be retained so long as they are in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

Subpart 97.39—Posting Placards of Instructions for Launching and Inflating Inflatable Liferafts

§ 97.39–1 When required.

(a) Every vessel equipped with inflatable liferafts shall have posted in conspicuous places which are regularly accessible to the crew and/or passengers, approved placards containing instructions for launching and inflating inflatable liferafts for the information of persons on board. The number and location of such placards shall be as determined necessary by the Officer in Charge, Marine Inspection.

(b) Under the requirements contained in § 160.051–6(c)(1) of Subpart 160.051 in Subchapter Q (Specifications) of this chapter, the manufacturer of approved inflatable liferafts is required to provide approved placards containing such instructions with each liferaft.

Subpart 97.40—Markings on Vessels

§ 97.40–1 Application.

(a) The provisions of this subpart shall apply to all vessels except as specifically noted.

§ 97.40–5 Markings required by Customs Regulations.

(a) The following markings are required by the Customs Regulations. Details of the application of the requirements as well as details of the required markings will be found in those regulations.

(1) *Name of vessel.* On both bows and the stern (yachts excepted), and on steam vessels the name is also required on both sides of the pilothouse, and on steam paddle wheel vessels on the outer side of each paddle box. Yachts shall have the name on the hull.

(2) *Hailing port.* On the stern.

(3) *Official number.* On the vessel's main beam.

(4) *Net tonnage.* On the vessel's main beam.

§ 97.40–10 Draft marks.

(a) All vessels 50 gross tons and over, under the jurisdiction of the U.S. Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at any place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the keel at the marks to the surface of the water, the bottom of the mark to indicate the draft in feet.

(b) In cases where the keel does not extend forward or aft to the location of the draft marks, due to raked stem or cut-away skeg, the datum line from which the draft shall be taken shall be obtained by projecting the line of the bottom of keel forward or aft, as the case may be, to the location of the draft marks.

(c) In cases where a vessel may have a skeg or other appendage extending locally below the line of the keel, the draft at the end of the vessel adjacent to such appendage shall be measured to a line tangent to the lowest part of such appendage and parallel to the line of the bottom of the keel.

§ 97.40–15 Load line marks.

(a) Vessels assigned a load line shall have the deck line and the load line marks permanently scribed or embossed as required by Subchapter E (Load Lines) of this chapter.

Subpart 97.43—Placard of Lifesaving Signals and Breeches Buoy Instructions

§ 97.43–1 Application.

(a) The provisions of this subpart shall apply to all vessels on an international voyage, and to all other vessels of 150 gross tons or over certificated for ocean, coastwise or Great Lakes service.

§ 97.43–5 Availability.

(a) On all vessels to which this subpart applies there shall be posted in the pilothouse and readily available to the deck officer of the watch a placard (Form CG–811) containing instructions for the use of breeches buoys and the lifesaving signals as set forth in Regulation 16, Chapter V, of the International Convention for Safety of Life at Sea, 1960. These signals shall be used by vessels or persons in distress when communicating with lifesaving stations and maritime rescue units.

(b) A copy of Form CG–811 shall also be conveniently posted in the engineroom and crews quarters of all vessels to which this subpart applies.

Subpart 97.45—Carrying of Excess Steam

§ 97.45–1 Master and chief engineer responsible.

(a) It shall be the duty of the master and the engineer in charge of the boilers of any vessel to require that a steam pressure is not carried in excess of that allowed by the certificate of inspection, and to require that the safety valves, once set and sealed by the inspector, are in no way tampered with or made inoperative except as provided in § 97.30–20.

Subpart 97.47—Routing Instructions

§ 97.47–1 All persons must comply.

(a) Due to existing mine field dangers, all licensed masters, officers, and certificated seamen on United States vessels shall comply strictly with the routing in-

structions issued by competent naval authority. Failure to comply with such routing instructions shall be deemed misconduct within the meaning of R. S. 4450, as amended (46 U. S. C. 239). Nothing herein shall be construed as relieving the master of the responsibility for the safety of his vessel.

Subpart 97.50—Compliance With Provisions of Certificate of Inspection

§ 97.50–1 Master or person in charge responsible.

(a) It shall be the duty of the master or other person in charge of the vessel to see that all of the provisions of the certificate of inspection are strictly adhered to. Nothing in this subpart shall be construed as limiting the master or other person in charge of the vessel, at his own responsibility, from diverting from the route prescribed in the certificate of inspection or taking such other steps as he deems necessary and prudent to assist vessels in distress or for other similar emergencies.

Subpart 97.53—Exhibition of License

§ 97.53–1 Licensed officers.

(a) All licensed officers on a vessel shall have their licenses conspicuously displayed as required by R.S. 4446, 46 U.S.C. 232.

Subpart 97.55—De-Energizing of Cargo Hold Lighting Circuits When Grain or Other Combustible Bulk Cargo Is Carried

AUTHORITY: The provisions of this Subpart 97.55 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.55–1 Master's responsibility.

(a) Before loading bulk grain, or similar combustible bulk cargo, the master shall have the lighting circuits to cargo compartments in which the bulk cargo is to be loaded de-energized at the distribution panel or panel board. He shall thereafter have periodic inspections made of the panel or panel board as frequently as necessary to ascertain that the affected circuits remain de-energized while this bulk cargo remains within the vessel.

§ 97.55–5 Warning notice posted.

(a) As a precaution against any subsequent unintentional re-energizing of the circuits specified above, an appropriate notice shall be posted at the location where the control is effected warning against re-energizing these circuits. Such notice shall remain posted while this bulk cargo remains within the vessel.

Subpart 97.60—Motion Picture Film and Equipment

§ 97.60–1 Type required.

(a) Only acetate or slow-burning film may be used. Nitrocellulose film is specifically prohibited.

(b) Projectors shall be of an approved type.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857)

Subpart 97.70—Power-Operated Industrial Trucks

AUTHORITY: The provisions of this Subpart 97.70 interpret or apply R.S. 4417a, as amended, 4472, as amended, 4488, as amended, 4491, as amended; 46 U.S.C. 391a, 170, 481, 489. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.70–1 Application.

(a) *Power-operated industrial trucks.* (1) Except as provided in subparagraph (3) of this paragraph, power-operated industrial trucks carried on board a vessel as part of the vessel's equipment for handling materials of any kind shall be in compliance with the applicable provisions of this subpart.

(2) Except as provided in subparagraph (3) of this paragraph, power-operated industrial trucks placed on board vessels for handling materials of any kind shall be in compliance with the applicable provisions of this subpart when such vessels are within the navigable waters of the United States, its territories and possessions but not including the Panama Canal Zone.

(3) When power-operated industrial trucks are used in spaces not containing dangerous or hazardous articles, as set forth in § 97.70–10(f), the installation of the minimum safety features of § 97.70–7(c) shall be carried out at the earliest opportunity but in any case not later than July 1, 1963.

(b) *Vessels.* (1) Vessels shall be in compliance with the applicable provisions of this subpart during those periods of time when power-operated industrial trucks are on board as part of the vessel's equipment or when such trucks are placed on board for handling materials of any kind.

NOTE: The regulations affecting the use of power-operated industrial trucks on foreign vessels are in Part 146 of Subchapter N (Dangerous Cargoes) or in the case of foreign tank vessels in Subpart 35.70 of Subchapter D (Tank Vessels) of this chapter.

§ 97.70–3 Alternates.

(a) In cases of undue hardship resulting from unavoidable delays in bringing existing power-operated industrial trucks into compliance with the applicable provisions of this subpart, the Commandant may permit the use of alternate equipment, apparatus, or arrangement for such period of time, and to such extent, and upon such conditions as will assure, to the Commandant's satisfaction, a degree of safety consistent with the minimum standards as set forth in this subpart.

(b) The methods and procedures adopted in connection with the modification of existing equipment to meet required laboratory designations will be taken into consideration in granting permission to use alternate arrangements for a limited period of time.

§ 97.70–5 Definitions of terms used in subpart.

(a) Power-operated industrial trucks are considered to be tractors, lift trucks, and other specialized industrial trucks used for material handling on board a vessel.

(b) For the purpose of the regulations in this subpart, the words "flammable" and "inflammable" are interchangeable or synonymous terms.

§ 97.70–7 Approved power-operated industrial trucks.

(a) Where approved power-operated industrial trucks are required by the regulations in this subchapter such approved trucks shall have a specific designation of a recognized testing laboratory. The following laboratories are recognized for the specific type designations listed:

(1) Underwriters' Laboratories, Inc. (Mailing address, P.O. Box 247, Northbrook, Ill., 60062) for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D and DS.

(2) Factory Mutual Laboratories, Engineering Division, 1115 Boston-Providence Turnpike, Norwood, Mass., 02062, for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D and DS.

(b) Description of recognized testing laboratory type designations are as follows:

(1) The "E" designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(2) The "EE" designated units are electrically powered units that have, in addition to all of the requirements for the "E" units, the electric motors and all other electrical equipment completely enclosed. In certain locations the "EE" unit may be used where the use of an "E" unit may not be considered safe.

(3) The "EX" designated units are electrically powered units that differ from the "E" and "EE" units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(4) The "G" designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(5) The "GS" designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where the use of a "G" unit may not be considered safe.

(6) The "LP" designated units are similar to the "G" units except that they are liquefied petroleum gas engine powered instead of gasoline powered.

(7) The "LPS" designated units are units similar to the "GS" units except that liquefied petroleum gas is used for fuel instead of gasoline.

(8) The "D" designated units are units similar to the "G" units except that

they are diesel engine powered instead of gasoline engine powered.

(9) The "DS" designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a "D" unit may not be considered safe.

(c) In addition to the construction and design safety features required in order to obtain a recognized laboratory type designation, approved power-operated industrial trucks shall have at least the following minimum safety features where applicable:

(1) Power-operated industrial trucks shall be equipped with a warning horn, whistle, or gong, or other device that can be heard clearly above the normal shipboard noises.

(2) Wherever power-operated industrial truck operation exposes the operator to danger from falling objects, the truck shall be equipped with a driver's overhead guard. Where overall height of the truck with forks in the lowered position is limited by head room conditions the overhead guard may be omitted.

NOTE: This overhead guard is only intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application. It is impractical to build a guard of sufficient strength to withstand the impact of a capacity load since such a guard would constitute a safety hazard because its structure would be so large that it might interfere with good visibility and would weigh so much that it might make the truck top-heavy and unstable.

(3) Power-operated fork lift trucks which handle small objects or unstable loads shall be equipped with a vertical load back rest or rack which shall have height, width and strength sufficient to prevent the load, or part of it, from falling toward the mast when the mast is in a position of maximum backward tilt.

(4) The forks on power-operated fork lift trucks shall be secured to the carriage so that unintentional lifting of the toe shall not occur on such application where this lifting may create a hazard. The factor of safety of forks shall be at least 3 to 1, based on the elastic limit of the material.

(5) Fork extensions or other attachments shall be suitably secured to prevent unintentional lifting or displacement on primary forks.

(6) All exposed wheels shall be provided with guards to prevent the wheels from throwing particles at the operator.

(7) Unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin, the steering knob, if used, shall be of a mushroom type to engage the palm of the operator's hand, or shall be arranged in some other manner to prevent injury. The knob shall be mounted within the perimeter of the wheel.

(8) All steering controls shall be confined within the clearances of the truck, or so guarded that movement of the controls shall not result in injury to the operator when passing obstructions, stanchions, etc.

§ 97.70–10 Use of power-operated industrial trucks in various locations.

(a) *Spaces containing explosives.* (1) Except as otherwise provided in this paragraph, power-operated industrial trucks shall not be used in a space in which Class A, Class B, or Class C explosives are stowed.

NOTE: Class A, Class B and Class C explosives are defined in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(2) The Commandant may grant authority for the use of approved power-operated industrial trucks with a recognized testing laboratory designation of EX in spaces in which Class A, Class B or Class C explosives are stowed when it can be shown that such trucks can be used with safety.

(3) In a space in which packaged small arms ammunition without explosive bullets is stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, LPS, GS and DS may be used for handling cargo including the handling of such packaged small arms ammunition.

(b) *Spaces containing flammable liquids.* (1) In a space in which packaged flammable liquids are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS, and DS may be used for handling cargo including the handling of such packaged flammable liquids.

(c) *Spaces containing flammable solids or oxidizing materials.* (1) In a space in which packaged flammable solids or oxidizing materials are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS, and DS may be used for handling cargo including the handling of such packaged flammable solids or oxidizing materials.

(2) When flammable solids or oxidizing materials are contained in closed cargo vans or closed containers and no other dangerous cargo is stowed in the hold or compartment, any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of of § 97.70–7(c) may be used in the spaces.

(3) When oxidizing materials in bulk are stowed in the holds or compartment, any approved commercial type power-operated industrial truck may be used in the spaces.

(d) *Spaces containing hazardous articles.* (1) In a space in which packaged or baled hazardous articles of a fibrous nature or bulk sulfur are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS and DS may be used for handling cargo, including the handling of such packaged or baled hazardous articles of a fibrous nature or bulk sulfur.

(2) When hazardous articles of a fibrous nature are contained in closed cargo vans or closed portable containers and no other dangerous cargo is stowed in the hold or compartment, any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of § 97.70–7(c) may be used in the spaces.

(e) *Spaces containing other dangerous cargoes and hazardous articles.* (1) In a space in which dangerous cargoes or hazardous articles subject to the regulations in Part 146 of this chapter except those provided for in paragraphs (a), (b), (c) and (d) of this section, any approved power-operated industrial truck may be used to handle cargo including the handling of such dangerous cargoes or hazardous articles.

(f) *Other spaces.* (1) Any standard commercial type power operated industrial truck in safe operating condition and having the minimum safety features of § 97.70–7(c) may be used in spaces and for handling cargo in spaces not otherwise restricted by regulation in this subpart.

§ 97.70–15 Special operating conditions.

(a) Notification shall be given to the master or senior deck officer on board before placing power-operated industrial trucks in use aboard the vessel.

(b) When power-operated industrial trucks are in use on board vessels subject to the regulations in this subchapter, they shall be in a safe operating condition.

(c) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of power-operated industrial trucks shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working. When necessary, portable blowers of adequate size and location shall be utilized.

(d) The parts and/or equipment of any power-operated industrial truck requiring replacement shall be replaced only by parts and/or equipment equivalent in safety when installed with those used in the original design.

(e) Any truck that emits sparks or flames from the exhaust system shall immediately be removed from service, and not again returned to service until the cause for the emission of such sparks or flames has been eliminated.

(f) When the temperature of any part of the truck is found to be in excess of a safe operating temperature, the truck shall be removed from service until such overheating has been corrected.

(g) Operation of trucks shall be halted immediately and the engines or motors secured, whenever an emergency condition arises aboard the vessel.

(h) Operation of trucks shall be halted immediately and the engines or motors secured in the event of breakage or leakage of containers used for the carriage of flammable liquids, flammable solids or oxidizing materials.

(i) The rated capacity of a truck shall at all times be posted on the truck in a conspicuous place and such capacity shall not be exceeded.

(j) At least one approved 2-pound dry chemical hand portable fire extinguisher, or its approved equivalent, shall be affixed to the truck in a readily accessible

position or kept in close proximity available for immediate use.

(k) Vessel's fire-fighting equipment, both fixed (where installed) and portable, in vicinity of space being worked shall be kept ready for immediate use.

§ 97.70–20 Refueling.

(a) *When permitted.* Power-operated industrial trucks are not permitted to be refueled in the hold of a vessel or on the weather deck except under the following conditions:

(1) Trucks using gasoline as fuel may be refueled in the hold or on the weather deck of a vessel only when such refueling is done with an acceptable portable nonspilling fuel handling system of not over 5 gallons capacity. Transfer of gasoline to these portable nonspilling fuel handling devices is not permitted on board the vessel.

(2) Power-operated industrial trucks using liquefied petroleum gas as fuel may be refueled in the hold or on the weather deck of a vessel only when fitted with removable tanks and provided the hand-operated shut-off valve of the depleted tank is closed and the engine is run until it stalls from lack of fuel before the quick disconnect fitting is opened. In addition, the quick disconnect fitting shall be attached to the fuel tank before the hand-operated shutoff valve is reopened.

(3) Power-operated industrial trucks using diesel oil as fuel may be refueled on the weather deck or in the hold of a vessel by means of portable containers of not over 5-gallon capacity. These trucks may also be refueled on the weather deck of a vessel or portable containers refilled from a larger container provided a suitable pump is used for the transfer operation and a drip pan of adequate size is supplied.

(b) *General requirements.* The following conditions must be met when refueling power-operated industrial trucks in the hold of a vessel or on the weather deck under the circumstances listed in paragraph (a) of this section:

(1) Refueling shall be under the direct supervision of an experienced and responsible person specifically designated for such job by the person in charge of the loading or unloading of the vessel.

(2) No refueling shall be undertaken with less than 2 persons specifically assigned and present for the complete operation, at least one of whom shall be experienced in using the portable fire extinguishers required in the fueling area.

(3) At least one approved 4-pound dry chemical hand portable fire extinguisher, or its approved equivalent shall be provided at the scene of the fueling area. This is in addition to portable extinguisher affixed to the truck in accordance with § 97.70–15(j).

(4) The location for refueling trucks shall be designated by the master or senior deck officer on board the vessel. "No Smoking" signs shall be posted in the area and smoking shall be prohibited.

(5) The location designated for refueling shall be adequately ventilated so as to insure against accumulation of a hazardous concentration of vapors. The ventilation requirements of § 97.70–15(c) when trucks are operating shall also apply when trucks are being refueled.

(6) Truck engines of all trucks in the same hold shall be stopped before any truck in that hold is refueled and before any fuel handling devices or unmounted liquefied petroleum gas cylinders are placed in the hold.

(7) All fuel handling devices and unmounted liquefied petroleum gas containers shall be removed from the hold before any truck engine is started and the trucks again placed in operation.

§ 97.70–25 Charging or replacing batteries.

(a) Batteries for electrically-powered industrial trucks and for the ignition systems of internal combustion engine-powered industrial trucks may be changed in the hold of a vessel provided the following conditions are met:

(1) Suitable handling equipment shall be employed.

(2) Adequate precautions shall be taken to avoid damage to the battery, short circuiting of the battery, and spillage of the electrolyte.

(b) Batteries of electrically-powered industrial trucks may be recharged in a hold of a vessel provided the following conditions are met:

(1) The batteries shall be housed in a suitable, ventilated, portable metal container with a suitable outlet at the top for connection of a portable air hose, or shall be placed directly beneath a suitable metal hood with a suitable outlet at the top for connection of a portable air hose. The air hose shall be permanently connected to an exhaust duct leading to the open deck and terminate in a gooseneck or other suitable weather head. If natural ventilation is not practicable or adequate, mechanical means of exhaust shall be employed in conjunction with the duct. The air outlet on the battery container shall be equipped with an interlock switch so arranged that the charging of the battery cannot take place unless the air hose is properly connected to the box.

(2) If mechanical ventilation is used, an additional interlock shall be provided between the fan and the charging circuit so that the fan must be in operation in order to complete the charging circuit for operation. It is preferable that this interlock switch be of a centrifugal type driven by the fan shaft.

(3) The hold shall not contain any cargo coming under the regulations in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(4) The charging facilities may be part of the truck equipment or may be separate from the truck and located inside or outside the cargo hold. The supply or charging circuit (whichever method is used) shall be connected to the truck by a portable plug connection of the break-away type. This portable plug shall be so engaged with the truck battery charging outlet that any movement of the truck away from the charging station will break the connection between the plug and receptacle without exposing any live parts to contact with a conducting surface or object, and without the plug falling to the deck where it may become subject to injury.

(c) All unmounted batteries shall be suitably protected or removed from an area in the hold of the vessel before trucks are operated in that area.

§ 97.70–30 Stowage of power-operated industrial trucks aboard a vessel.

(a) Power-operated industrial trucks may be stowed in any location aboard a vessel provided the following conditions are met:

(1) Gasoline powered trucks shall have all the fuel expended from the system.

(2) Liquefied petroleum gas powered trucks shall have the fuel tanks removed and all the fuel expended from the system.

(b) Power-operated industrial trucks not meeting the conditions set forth in paragraph (a) of this section shall be stowed on the open deck except for intervals such as lunch hours, between work shifts, interdock and intraport movements. If stowed in a fixed metal enclosure located on or above the weather deck, such enclosure shall have access from the weather deck only and shall have adequate ventilation, so arranged as to remove vapors from both the upper and lower portions of the space.

§ 97.70–35 Stowage of fuel handling devices aboard a vessel.

(a) Flammable liquids and gases to be used as fuels for power-operated industrial trucks shall be marked, labeled and stowed as follows:

(1) They shall be stowed in ICC specification containers, A.S.M.E. containers or portable safety containers having the approval of a recognized testing laboratory, which containers are authorized for the contents.

(2) Containers shall be marked with the name of the contents and shall be labeled in accordance with ICC requirements as follows:

(i) Flammable liquids—"Red Label"; or,

(ii) Flammable gases—"Red Gas Label".

(3) Containers shall be stowed on or above the weather deck in locations designated by the master. ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory may be stowed below the weather deck in a paint or lamp locker provided such containers do not exceed 5 gallons capacity each.

(b) Diesel fuel shall be stowed in locations designated by the master.

Subpart 97.75—Prevention of Oil Pollution

§ 97.75–1 Prohibited zones.

(a) All cargo vessels shall be so operated as to meet the requirements of the Oil Pollution Act, 1924 (33 U.S.C. 431–437). In addition, all cargo ships shall be so operated as to avoid discharging

any oil or oily ballast which may foul the surface of the sea, within any of the prohibited zones set forth in the Oil Pollution Act, 1961 (33 U.S.C. 1001–1015).

(Sec. 8, 75 Stat. 403; 33 U.S.C. 1007. Treasury Department Order 167-46, November 6, 1961, 26 F.R. 10609)

PART 98—SPECIAL CONSTRUCTION, ARRANGEMENT, AND PROVISIONS FOR CERTAIN DANGEROUS CARGOES IN BULK

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AUTHORITY: The provisions of this Part 98 issued under R.S. 4405, as amended, 4462, as amended, 4472, as amended; 46 U.S.C. 375, 416, 170. Interpret or apply R.S. 4417a, as amended, 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391a, 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 98.01—Application

§ 98.01–1 General.

(a) The provisions of this part shall apply to all vessels which carry in bulk any of the dangerous cargoes specifically noted in this part.

(b) The provisions of Subpart 98.35 shall apply to portable tanks for the transportation of combustible liquids on board cargo vessels described in § 90.05–1 in this subchapter. Certain provisions in Subpart 98.35 apply to United States flag vessels and to foreign vessels when such vessels have on board combustible liquid cargo in portable tanks other than in drums, barrels, or other packages.

§ 98.01–5 Effective date.

(a) The provisions in this part which require inspection and certification of vessels shall be in effect on and after January 1, 1959, for new construction and on and after January 1, 1960, for existing vessels. Vessels in existence on January 1, 1959, and vessels contracted for prior to January 1, 1959, which may carry in bulk any of the dangerous cargoes specifically noted in this part shall meet the applicable requirements of this subchapter or Subchapter D (Tank Vessels) of this chapter, as is reasonable and practicable in the opinion of the Officer in Charge, Marine Inspection, to qualify for certification. In this respect the Officer in Charge, Marine Inspection, may grant departures from specific requirements of this chapter if in his opinion the circumstances warrant such departures. In any case the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel and its equipment are in good condition and satisfactory for the purposes intended.

(b) The other provisions of this part shall be in effect on and after July 1, 1958.

(c) The provisions of Subpart 98.35 regarding portable tanks for combustible liquids shall be in effect on and after March 1, 1963.

Subpart 98.03—Barges Carrying Dangerous Cargoes

§ 98.03–1 Application.

(a) All barges carrying in bulk any of the dangerous cargoes specifically noted in this part shall be subject to the applicable provisions of this subpart.

(b) Barges which are built or converted to conform to the requirements of §§ 98.03–7, 98.03–8, 98.03–15, 98.03–20, 98.03–25 and 98.03–30 will be exempt from compliance with the requirements of § 98.03–10.

§ 98.03–5 Effective dates for certain requirements.

(a) The special operating requirements in § 98.03–10 for all open hopper type barges while carrying in bulk any of the dangerous cargoes specifically noted in this part shall be in effect on and after March 1, 1963.

(b) All barges, the construction or conversion of which is started on or after July 1, 1964, shall conform to the requirements of §§ 98.03–7, 98.03–8, 98.03–15, 98.03–20, 98.03–25, and 98.03–30.

§ 98.03–7 Barge hull classifications.

(a) Each barge constructed or converted in conformance with this subpart shall be assigned a hull type number. The Commandant will designate the barge hull types to be used for carrying cargoes in order to insure that the vessel is designed consistent with the degree and nature of the hazard of the commodity carried.

(b) For this purpose the barge hull types shall be defined as follows:

(1) *Type I barge hull.* Barge hulls classed as Type I are those designed to carry products which require the maximum preventive measures to preclude the uncontrolled release of the cargo to the waterways and/or atmosphere.

(2) *Type II barge hull.* Barge hulls classed as Type II are those designed to carry products which require substantial preventive measures to preclude uncontrolled release to the atmosphere, but whose uncontrolled release to the waterways does not constitute a longlasting public or operating personnel hazard, though local and temporary pollution may occur.

(3) *Type III barge hull.* Barge hulls classed as Type III are those designed to carry products of sufficient hazard to require a moderate degree of control.

§ 98.03–8 Alternative arrangements.

(a) Alternative arrangements, differing from those specifically required by this subpart, may be considered and approved by the Commandant, if it is demonstrated to his satisfaction that a degree of safety is obtained which is consistent with the intent of this subpart.

§ 98.03–10 Special operating requirements for open hopper type barges while carrying dangerous cargoes in bulk.

(a) All open hopper type barges, while carrying in bulk any of the dangerous cargoes specifically noted in this part, shall be operated in conformance with the provisions in this section. However, the provisions in this section are not applicable to such barges when empty (not necessarily cleaned or gas-freed).

(b) (1) Except as otherwise provided in this section, no such open hopper type barge shall be placed as lead barge in any tow. Such barges shall be placed in protected positions within the tow so that the danger from diving or swamping will be minimized. Where, due to operating conditions, compliance with this subparagraph is impossible, the provisions of subparagraph (3) of this paragraph apply. The person in charge of the towing vessel shall be responsible for compliance with this subparagraph.

(2) No such open hopper type barge shall be moved from a loading facility unless all void spaces and bilges are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure the maintenance of such water-free conditions, in order to minimize the free surface effect in both the longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments shall be closed and secured at all times. In the case of unmanned barges, the person in charge of the towing vessel shall be deemed to be in charge of the barge, and all requirements to be carried out on the barge shall be carried out by or under the direction of such person.

(3) When an open hopper type barge is in an exposed position, such that protection from swamping provided by adjoining barges cannot be obtained from location within the tow alone, it shall be the responsibility of the person in charge of the towing vessel to control speed so as to insure protection against diving and swamping of the barge, having regard to its design and freeboard, and other operating conditions.

(c) To show that special operating requirements apply to a specific open hopper type barge, additional placards or signs shall be displayed in at least four different locations on the barge when the cargoes subject to this part are carried in any form in the cargo tanks. The placards or signs shall be posted on the barge approximately amidships on each side and near the centerline of each end, facing outboard. Racks, or other suitable means, for mounting such placards or signs shall be so arranged as to provide clear visibility and shall be protected from becoming readily damaged or obscured. The placards or signs shall be at least equal in dimensions to the ICC standard tank car "Dangerous" placard (10¾ inches square or larger), and shall display a circle (10 inches in diameter or larger) with alternating quadrants of white and red, and so mounted that the red quadrants are centered on the vertical axis. The shipper and/or owner of the barge shall be responsible for the installation of the required placards or signs, including maintenance of them while such barge is in temporary storage with cargo aboard. The person in charge of the towing vessel shall be responsible for the continued maintenance of the placards or signs while such barge is in transit.

§ 98.03–15 Rakes and coamings.

(a) Each barge hull shall be constructed with a suitable bow form (length, shape and height of headlog) to protect against diving at the maximum speed at which the barge is designed to be towed. In any integrated tow, only the lead barge need comply with this requirement. In any case, the operator of the towing vessel shall be guided by appropriate speed limitations.

(b) All open hopper type barges shall be provided with coamings around the hopper space and a 36-inch minimum height plowshare breakwater on the forward rake. Coamings shall have a minimum height of 36 inches forward graduated to a minimum height of 24 inches at midlength and 18 inches thereafter.

§ 98.03–20 Subdivision and stability.

(a) *General.* In addition to complying with the requirements of Part 93 of this subchapter as applicable, Types I and II barge hulls shall comply with the provisions of this section.

(b) *Types I and II barge hulls.* (1) Types I and II barge hulls shall be constructed with a complete watertight deck, or if of "open hopper type", with such construction that positive buoyancy and stability will be maintained when the barge is fully loaded and the hopper space is flooded to the level of the main deck. Credit may be given for the buoyancy, if any, of the immersed portion of the full cargo tanks when an effective arrangement for securing the tanks is provided.

(2) (i) Type I barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth including the intersection of a transverse and a longitudinal watertight bulkhead.

(ii) Type I box barge hulls, specifically designed for operation in an integrated tow, shall retain positive buoyancy and stability after holing the bottom shell plating anywhere on its girth, except in way of a transverse watertight bulkhead, or after holing the side shell plating in way of a transverse watertight bulkhead.

(3) Type II barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth except in way of a transverse watertight bulkhead.

§ 98.03–25 Hull structure.

(a) *General.* In addition to complying with the structural requirements of Part 92 of this subchapter as applicable, Types I and II barge hulls shall comply with the provisions of this section.

(b) *Types I and II barge hulls.* Under an assumed grounding condition such that the forward rake bulkhead rests upon a pinnacle at the water surface, the maximum hull bending stress shall not exceed the following limits:

(1) Independent tanks may be installed in such a manner so that they do not contribute to the strength and stiffness of the barge. In such case, the hull stress shall not exceed either 50 percent of the minimum ultimate tensile strength of the material or 70 percent of the yield strength when specified, whichever is greater.

(2) The Commandant may consider a reduction in hull stress when independent tanks are installed in such a manner as to contribute to the strength and stiffness of the barge and this is accounted for in determining the effective section modulus of the barge. In such case, the hull stress shall not exceed the percentage stress values prescribed in subparagraph (1) of this paragraph, multiplied by the quantity $\left(1.5-\frac{SWT}{UTS}\right)$, where SWT is the stress calculated without including the effect of the tanks, and UTS is the minimum ultimate tensile strength of the material. The value SWT, however, shall in no case be more than 75 percent of UTS.

§ 98.03–30 Cargo tanks and supports.

(a) *General.* Saddles and hold-down securing straps for independent cargo tanks shall be designed to prevent tank failure due to loads induced in the saddles or straps by barge deflection.

(b) *Collision protection.* (1) All independent cargo tanks installed on Type I and Type II barge hulls shall be protected with suitable collision chocks or

collision straps to withstand a longitudinal collision load of one and one-half times the weight of the tank and cargo. All other independent cargo tanks shall be provided with suitable collision chocks or collision straps to withstand a longitudinal collision load equal to the weight of the tank and cargo.

(2) All cargo tanks shall be so located as to reduce the likelihood of their being damaged in the event of collision. This protection shall be obtained by locating the cargo tanks not less than 4 feet from the side-shell and box-end for Type I barge hulls and 3 feet for Type II barge hulls, and not less than 25 feet from the headlog at the bow for both types.

(c) *Cargo tank design*—(1) *Types I and II barge hulls.* (i) In addition to requirements provided for in applicable regulations for a specific commodity, cargoes subject to the provisions of this subpart shall be transported in cargo tanks meeting the requirements of this paragraph. Pressure vessel type cargo tanks shall have sufficient additional strength so as to limit the maximum combined tank stress, including saddle horn and bending stresses, to 1.5 times the maximum allowable hoop stress in still water, and to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by § 98.03–25(b).

(ii) Gravity type cargo tanks shall have sufficient additional strength to limit the maximum combined tank stress, including saddle horn and bending stresses, to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by § 98.03–25(b).

(2) *Type III barge hulls.* In addition to the requirements of this paragraph, pressure-vessel-type cargo tanks shall have sufficient additional strength so as to limit the maximum combined stress, including saddle horn and bending stress, to 1.5 times the maximum allowable hoop stress.

§ 98.03–35 Special operating requirements for barges carrying certain dangerous cargoes in bulk.

(a) The requirements of this section shall apply to all barges carrying in bulk any of the dangerous cargoes specifically noted in this part.

(b) All barges constructed or modified in conformance with the requirements of this subpart are exempt from the provisions of § 98.03–10.

(c) When it is necessary to operate box or square-end barges as lead barges of tows, the person in charge of the towing vessel shall control the speed to insure protection against diving and swamping of such barges, having due regard to their design and freeboard, and to the operating conditions.

(d) All barges, while carrying in bulk any of the dangerous cargoes specifically noted in this part, shall be operated in conformance with the provisions of this section. However, the provisions of this section are not applicable to such barges when empty and gas-freed.

(e) Barges shall not be moved from a loading facility unless all bilges and void spaces (except those used for ballasting) are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure maintenance of such water-free condition in order to minimize the free surface effects, both in longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments other than cargo spaces shall be closed and secured at all times.

(f) (1) Warning signs shall be displayed on the vessel, port and starboard, facing outboard without obstructions, at all times except when the vessel is gas free. The warning sign shall be rectangular and a minimum of three feet wide and two feet high. It shall be of sufficient size to accommodate the required alerting information, which shall be shown in black block style letters and numerals (characters) at least three inches high on a white background. The minimum spacing between adjacent words and lines of characters shall be two inches. The minimum spacing between adjacent characters shall be one-half inch. All characters shall have a minimum stroke width of one-half inch and shall be a minimum of two inches wide, except for the letters "M" and "W" which shall be a minimum of three inches wide, and except for the letter "I" and the numeral "1" which may be one-half inch wide. The signs shall have a two-inch minimum white border clear of characters. The signs shall be maintained legible. The alerting information shall include the following:

(i) Danger.

(ii) Categories of hazards: (This shall be as listed in the classification column in § 146.04–5, in Subchapter N (Dangerous Cargoes) of this chapter, and additional descriptive terms, as applicable).

(iii) Cargo identification by name: (This name shall be as listed in § 146.04–5 in Subchapter N (Dangerous Cargoes) of this chapter. If not specifically listed by name, the common chemical name as shown on the information card shall be used.)

(iv) Prohibitions: (Necessary prohibitions, such as "No Smoking," etc.).

(2) An information card for each cargo being transported shall be carried on the bridge or in the pilot house of the towing vessel readily available for use by the person in charge of the watch. Such information card shall also be carried aboard the barge when it is not gas free. The minimum card size shall be 7" by 9½". The card shall have legible printing on one side only. The following data shall be listed:

(i) *Cargo identification and characteristics.* Identification of the cargo as listed in § 146.04–5 in Subchapter N (Dangerous Cargoes) of this chapter and its common chemical name if the chemical name is not so specifically listed, its appearance and odor. A statement of the hazards involved and instructions for the safe handling of the cargo and, as applicable, the need for special cargo environments.

(ii) *Emergency procedures.* Precautions to be observed in the event of spills, leaks, or equipment or machinery breakdown and/or uncontrolled release of the cargo into the waterway or atmosphere. Precautions to be observed in the event of exposure of personnel to toxic cargoes.

(iii) *Firefighting procedures.* Precautions to be observed in the event of a fire occurring on or in the vicinity of the barge, and an enumeration of firefighting media suitable for use in case of a cargo fire.

(3) In the event that a barge is or has been loaded with two or more dangerous cargoes and until the tanks containing such cargoes have been gas freed, the following additional requirements shall be met:

(i) A warning sign, meeting the requirements of subparagraph (1) of this paragraph and setting forth the alerting information required by subparagraph (1) (i) and (iv) of this paragraph, shall be located amidships.

(ii) The warning signs for each cargo meeting the requirements of subparagraph (1) of this paragraph and setting forth the alerting information required by subparagraph (1) (ii) and (iii) of this paragraph shall be so located that each sign positively identifies the contents of each tank.

(iii) An information card for each cargo (see subparagraph (2) of this paragraph) shall be carried for ready reference aboard the barge.

(g) During the time the cargo tanks contain dangerous cargoes subject to the provisions of this subpart in any amount, in the liquid or gaseous state, the barge shall be under constant surveillance.

(1) A strict watch of each unmanned barge in tow shall be maintained from the towing vessel while underway.

(2) A towing vessel engaged in transporting such unmanned barges shall not leave them unattended. When a barge is moored, but not gas free, it shall be under the observation of a watchman who may be a member of the complement of the towing vessel, or a terminal employee, or other person. Such a person shall be responsible for the security of the barge and for keeping unauthorized persons off the barge. Such person shall be provided with, read, and have in his possession for ready reference the information cards required by paragraph (f) (2) of this section.

§ 98.03–40 Manning of barges carrying dangerous cargoes in bulk.

(a) Except as provided for in this section, barges need not be manned unless in the judgment of the Officer in Charge, Marine Inspection, such manning is necessary for the protection of life and property and for the safe operation of the vessel: *Provided, however,* That towing vessels, while towing barges which are not required to be manned, shall be provided with and have on board the information card required by § 98.03–35,

which card shall be in the possession of the master or person in charge.

(b) At least one member of the crew of barges required to be manned pursuant to paragraph (a) of this section shall be especially qualified in the handling of the specific cargo to be carried. The Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in, and capable of performing competently, the necessary operations which relate to the carriage and transfer of such cargo.

§ 98.03–45 Cargo handling.

(a) A sufficient number of persons shall be on duty to perform cargo transfer operations. A person especially qualified in the handling of the specific cargo to be transferred shall be on duty to perform or supervise cargo transfer operations, which person shall be considered to be in charge of such operations. The Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in, and capable of performing competently, the necessary operations which relate to the transfer of such cargo.

(b) The shipper and the owner, charterer, agent, master, or person in charge of any barge carrying dangerous cargoes subject to the provisions of this subpart, shall insure that the requirements of this section and § 98.03–40 are complied with.

Subpart 98.05—Elemental Phosphorus in Water in Bulk

§ 98.05–1 General.

(a) Elemental phosphorus, white or yellow, in water may be carried in bulk only in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying elemental phosphorus in water in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.05–5 Types of cargo tanks.

(a) Tanks in which the vessel's structure forms a part thereof may be employed, provided void spaces are located surrounding the tanks on the sides and bottom.

(b) Tanks independent of the hull either cylindrical or of rectangular design may be employed. The plating of such tanks shall be not less than 5/16 inch thick.

(c) The tanks shall be designed and tested to a head of 8 feet above the tank top or the highest level the lading may rise, whichever is the greater.

(d) When a water displacement method of discharge is used, pressure-vessel type cargo tanks, designed and tested in accordance with Subchapter F (Marine Engineering) of this chapter shall be employed. Such tanks shall be designed for the maximum pressure to which they may be subjected when water pressure is used to discharge the cargo.

§ 98.05–10 Venting.

(a) Each cargo tank shall be fitted with an approved pressure-vacuum relief valve set to discharge at a pressure not exceeding 2 pounds per square inch. The discharge therefrom shall lead overboard above the waterline. When pressure vessel type tanks are used, each tank shall be fitted with a relief valve of suitable size.

§ 98.05–15 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of independent cargo tanks, or such tanks shall be made movable.

§ 98.05–20 Openings in tanks.

(a) Openings in tanks are prohibited below deck except for access openings used for inspection and maintenance of tanks. Manholes or access trunks shall be of not less than 20 inches diameter. Openings shall be fitted with bolted cover plates and gaskets resistant to the attack of phosphorus pentoxide.

§ 98.05–25 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent. When pressure vessel type tanks are used outage need not be provided.

§ 98.05–30 Cargo discharging.

(a) Pumps shall be employed in the discharge of cargo except when pressure vessel type tanks are used, water displacement method may be employed. The use of compressed air to discharge cargo is prohibited.

§ 98.05–35 Cargo temperature.

(a) Cargo shall be loaded at a temperature not exceeding 140° F., and then cooled until the water above the cargo has a temperature not exceeding 105° F. prior to the movement of the vessel. Upon presentation of satisfactory proof that procedures followed will provide adequate safety in transportation and handling, the Commandant may authorize movement of the vessel following cooling of the water above the cargo to a temperature not exceeding 115° F.

§ 98.05–40 Heating coils.

(a) Coils in which steam or hot water is circulated to heat the cargo so that it may be pumped shall be located outside the cargo tanks.

§ 98.05–45 Void flooding.

(a) A fixed ballast piping system (including a power driven pump of ample capacity), or other means acceptable to the Commandant shall be installed so that any void space surrounding the fixed tanks may be flooded.

§ 98.05–50 General requirements.

(a) All enclosed compartments containing independent cargo tanks and machinery spaces containing cargo pumps for handling liquid phosphorus shall be provided with effective means of ventilation.

(b) Cargo piping shall be of steel or wrought iron. Flanges and pipe fittings shall be of steel or malleable iron. Valves shall be of steel or bronze.

(c) Cargo lines shall be traced with steam piping and secured thereto by lagging to prevent solidification of cargo during transfer operations.

(d) A water hose shall be connected ready for immediate use and any spillage of phosphorus shall be immediately washed down.

(e) At least two fresh air masks or self-contained oxygen breathing apparatus shall be stowed on board the vessel at all times for use of personnel entering the tanks or adjacent spaces.

(f) Authorization from the Commandant (MMT) shall be obtained to transport lading other than phosphorus in the cargo tanks or to have on board any other cargo when phosphorus is laden in the tanks.

(g) Mechanical ventilation of sufficient capacity to insure a change of air every three minutes shall be provided during the inspection and maintenance of the cargo tanks.

(h) During the time elemental phosphorus is laden in the tanks, the barge shall be under constant surveillance. A towing vessel engaged in transporting such barges shall not leave the barge unattended except when the barge is moored at a pier, wharf, dock or other terminal and then only if such facility is provided with watchman or guard service.

(i) The Interstate Commerce Commission standard "Dangerous" placard shall be displayed in four locations on the barge when elemental phosphorus is laden in the tanks. A placard shall be posted approximately amid ships on each side facing outboard, and a placard shall be posted at each end of the barge at about the end of the tanks facing outboard. After unloading and before a tank or tanks are cleaned, the placard shall be reversed to show the "Dangerous—Empty" legend.

(j) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

§ 98.05–55 Electrical bonding.

(a) Independent cargo tanks shall be electrically grounded to the hull. The barge shall be electrically connected to the shore piping prior to connecting the cargo hose. This electrical connection shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 98.05–60 Tests and inspections.

(a) Each gravity tank shall be tested before being put into service as prescribed in § 98.05–5(c).

(b) Tanks shall be retested as prescribed in § 98.05–5 eight years after being placed into service and at each four-

year interval thereafter, as well as before being returned to service after extensive repairs.

Subpart 98.10—Sulfuric Acid in Bulk

§ 98.10–1 General.

(a) Sulfuric acid or spent sulfuric acid may be carried in bulk only in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying sulfuric acid or spent sulfuric acid in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.10–5 How acid may be carried.

(a) Sulfuric acid of concentration of 77.5 percent (1.7019 specific gravity) (59.8° Baume) or greater concentrations with or without an inhibitor, provided the corrosive effect on steel measured at 100° F. is not greater than that of 66° Baume commercial sulfuric acid, may be transported in unlined gravity type cargo tanks or unlined pressure-vessel type cargo tanks.

(b) Sulfuric acid of concentration of 65.25 percent (1.559 specific gravity) (52° Baume) or greater concentrations, provided the corrosive effect on steel measured at 100° F. is not greater than that of 52° Baume commercial sulfuric acid, may be transported in unlined pressure-vessel type cargo tanks independent of the vessel's structure.

(c) Sulfuric acid of concentration not to exceed 65.25 percent (1.559 specific gravity) (52° Baume) may be transported in gravity type cargo tanks or pressure-vessel type cargo tanks which are lined with lead or other equally suitable acid-resistant material acceptable to the Commandant.

(d) Sulfuric acid of concentration not to exceed 51 percent (1.408 specific gravity) (42° Baume) and spent sulfuric acid resulting from the use of sulfuric acid in industrial processes may be transported in gravity type cargo tanks which are lined with rubber or other equally suitable acid-resistant material acceptable to the Commandant.

(e) Spent or sludge sulfuric acid resulting from the use of sulfuric acid in industrial processes may be transported in unlined gravity type cargo tanks or unlined pressure vessel type cargo tanks, provided the corrosive effect on steel is not greater than that of commercial sulfuric acid as prescribed in paragraph (a) of this section.

§ 98.10–10 Gravity type cargo tanks.

(a) Gravity type cargo tanks shall be designed and tested to meet the rules of the American Bureau of Shipping for a head of water at least 8 feet above the tank top or the highest level the lading may rise, whichever is the greater. The plate thickness of any part of the tank shall not be less than $\frac{3}{8}$ inch. Such tanks may form an integral part of the ship's structure, or may be independent of the ship's structure, or form a part thereof.

(b) Gravity type tanks shall be vented to atmosphere. A vent shall be fitted having a cross-sectional area of not less than that of the filling line unless an ullage opening is provided having a cross-sectional area at least equal to that of the filling line. The minimum size of a cargo tank vent shall be not less than $2\frac{1}{2}$ inches. The outlet end of the vent shall terminate above the weather deck, clear of all obstructions and away from any source of flame. The vent shall terminate in a gooseneck bend and shall be fitted with a single flame screen of at least 30 x 30 mesh; or two screens of at least 20 x 20 mesh, not less than 1 inch nor more than $1\frac{1}{2}$ inches apart. The flame screens shall be corrosion-resistant wire. No shut-off valve or frangible disc shall be fitted in the vent lines.

(c) Compressed air shall not be used to discharge cargo from gravity type cargo tanks.

§ 98.10–15 Pressure-vessel type cargo tanks.

(a) Pressure-vessel type tanks shall be independent of the vessel's structure and shall be designed for the maximum pressure to which they may be subjected when compressed air is used to discharge the cargo, but in no case shall the design pressure be less than 50 pounds per square inch.

(b) Pressure-vessel type cargo tanks shall be designed as Class II or Class III unfired arc-welded cylindrical pressure vessels, inspected and tested as required by Subchapter F (Marine Engineering) of this chapter.

(c) Tanks designed, inspected, and tested as required by Interstate Commerce Commission Specification 103A, 103A–W, 103B, or 103B–W will be accepted as pressure-vessel type cargo tanks, provided the maximum pressure to which the tanks may be subjected does not exceed 30 pounds per square inch, and provided that prior to installing such tanks on a barge or cargo vessel, the owner shall furnish the Commandant with a copy of the inspection report certifying that the tanks and appurtenances comply with Interstate Commerce Commission specifications.

(d) When compressed air is used to discharge the cargo, the tank shall be fitted with a vent led to atmosphere in which shall be installed a rupture disc. The rupture disc shall be designed to burst at a pressure not exceeding the design pressure of the tank. An auxiliary vent to relieve the pressure or vacuum in the tank during filling or discharge of the cargo may be led from the vent line between the tank and the rupture disc. A shut-off valve may be fitted in the auxiliary vent.

(e) Except as otherwise specified in this section, the vents shall conform to the requirements of § 98.10–10 (b).

§ 98.10–20 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of independent cargo tanks, or such tanks shall be made movable.

§ 98.10–25 Openings in tanks.

(a) Openings in tanks are prohibited below deck, except for access openings used for inspection and maintenance of tanks, or unless otherwise specifically approved by the Commandant. Openings shall be fitted with bolted cover plates and acid-resistant gaskets.

§ 98.10–30 Cargo piping.

(a) Where special arrangements are approved by the Commandant to permit a pump suction to be led from the bottom of the tank, the filling and discharge lines shall be fitted with shut-off valves located above the weather deck or operable therefrom.

§ 98.10–35 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent.

§ 98.10–40 Lining.

(a) The interior surfaces of cargo tanks shall be made smooth, welds chipped or ground smooth, and the surfaces thoroughly cleaned before the lining is applied. All interior surfaces of the tanks shall be maintained free from scale, oxidation, moisture and all foreign matter during the lining process.

(b) The material used for lining or coating the tanks shall be resistive to attack by the sulfuric acid to be carried; homogeneous, nonporous, and imperforate when applied; and not less elastic than the metal of the tank proper. It shall be of substantially uniform thickness, not less than $\frac{5}{32}$ inch for lead lining, and not less than $\frac{3}{16}$ inch for rubber lining. The lining shall be directly bonded to the tank plating, or attached by other satisfactory means acceptable to the Commandant.

(c) Rubber lining shall be scarfed at the joints to overlap at least $1\frac{1}{2}$ inches, and the faying surfaces shall be beveled to an angle of approximately 45° with vulcanizing being done in place.

(d) Cargo piping, including valves, fittings, and flanges, when subject to the corrosive attack of the acid, shall be lined or coated with corrosion-resistant material. Vent piping, including flanges and fittings, shall be similarly lined or coated at least to the height of the frangible disc, if such is installed.

§ 98.10–45 General requirements.

(a) All enclosed compartments containing sulfuric acid cargo tanks and all machinery spaces containing cargo pumps for handling sulfuric acid shall be fitted with effective means of ventilation.

(b) Cargo pumps, piping, valves, fittings, and flanges used in the handling of sulfuric acid cargo shall be made of material resistive to attack by the sulfuric acid to be carried, or shall be suitably protected against such corrosive attack.

(c) A separator shall be fitted in compressed air lines to the tank when air pressure is used to discharge the cargo.

(d) The use of naked lights and artificial lights, other than electric lights or portable battery lights, is prohibited during the filling and discharge operations. Smoking is prohibited and the master or officer in charge of the vessel shall post "No Smoking" signs during filling and discharging operations. All tools used in the loading or unloading operations shall be of the nonsparking type. Fire or other naked lights shall not be applied to any tank for the purpose of liquefying congealed sulfuric acid. Heating coils will only be permitted as a means of liquefying frozen or congealed sulfuric acid.

(e) A water hose shall be connected ready for immediate use and any leakage or spillage of acid shall be immediately washed down.

(f) Tanks approved for the transportation of sulfuric acid in bulk shall not be used for the transportation of any other commodity, except upon authorization by the Commandant (MMT).

(g) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

§ 98.10–50 Tests and inspections.

(a) Each gravity type cargo tank shall be tested before being put into service as prescribed in § 98.10–10(a).

(b) Unlined gravity type cargo tanks shall be retested as prescribed in § 98.10–10 (a) eight years after being placed into service and at each four year interval thereafter, as well as before being returned to service after extensive repairs.

(c) Unlined pressure-vessel type cargo tanks shall be subjected to a hydrostatic pressure of one and one-half times the design pressure at any time the marine inspector considers such hydrostatic tests necessary to determine the condition of the tanks.

(d) Each cargo tank shall be subjected to an internal examination at least once in every four years. Where the lining of a cargo tank has deteriorated in service or is not in place, the marine inspector may require such tank to be subjected to the prescribed hydrostatic test if deemed necessary to determine the condition of the tank.

Subpart 98.15—Hydrochloric Acid in Bulk

§ 98.15–1 General.

(a) Hydrochloric acid may be carried in bulk in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying hydrochloric acid in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter as applicable.

§ 98.15–5 How acid may be carried.

(a) Hydrochloric acid shall be carried in gravity or pressure type cargo tanks which are independent of the vessel's structure provided such tanks are lined with rubber or other equally suitable material acceptable to the Commandant.

§ 98.15–10 Gravity type cargo tanks.

(a) Gravity type cargo tanks shall be designed and tested to meet the rules of the American Bureau of Shipping for a head of water at least 8 feet above the tank top or the highest level the lading may rise, whichever is the greater. The plate thickness of any part of the tank shall not be less than 3/8 inch. Such tanks shall be independent of the vessel's structure.

(b) Gravity type tanks shall be vented to atmosphere. A vent shall be fitted having a cross-sectional area of not less than that of the filling line unless an ullage opening is provided having a cross-sectional area at least equal to that of the filling line. The minimum size of a cargo tank vent shall not be less than 2½ inches. The outlet end of the vent shall terminate above the weather deck, clear of all obstructions and away from any source of flame. The vent shall terminate in a gooseneck bend and shall be fitted with a single flame screen of at least 30 x 30 mesh; or two screens of at least 20 x 20 mesh, not less than 1 inch nor more than 1½ inches apart. The flame screens shall be of corrosion-resistant wire. No shut-off valve or frangible disc shall be fitted in the vent lines.

(c) Compressed air shall not be used to discharge cargo from gravity type cargo tanks.

§ 98.15–15 Pressure-vessel type cargo tanks.

(a) Pressure-vessel type cargo tanks shall be independent of the vessel's structure and shall be designed for the maximum pressure to which they may be subjected when compressed air is used to discharge the cargo, but in no case shall the design pressure be less than 50 pounds per square inch.

(b) Pressure-vessel type cargo tanks shall be designed as Class II or Class III unfired arc-welded cylindrical pressure vessels, inspected and tested as required by Subchapter F (Marine Engineering) of this chapter.

(c) Tanks designed, inspected and tested as required by Interstate Commerce Commission Specification 103B or 103B–W will be accepted as pressure-vessel type cargo tanks: *Provided*, That the maximum pressure to which the tanks may be subjected does not exceed 30 pounds per square inch, and: *Provided further*, That prior to installing such tanks on a barge or cargo vessel, the owner shall furnish the Commandant with a copy of the inspection report certifying that the tanks and appurtenances comply with Interstate Commerce Commission specifications.

(d) When compressed air is used to discharge the cargo, the tank shall be fitted with a vent led to atmosphere in which shall be installed a rupture disc. The rupture disc shall be designed to burst at a pressure not exceeding the design pressure of the tank. An auxiliary vent to relieve the pressure or vacuum in the tank during filling or discharge of the cargo may be led from the vent line between the tank and the rupture disc. A shut-off valve may be fitted in the auxiliary vent.

(e) Except as otherwise specified in this section, the vent shall conform to the requirements of § 98.15–10 (b).

§ 98.15–20 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of the tanks, or such tanks shall be made movable.

§ 98.15–25 Openings in tanks.

(a) Openings in tanks are prohibited below deck, except for access openings used for inspection and maintenance of tanks, or unless otherwise specifically approved by the Commandant. Openings shall be fitted with bolted cover plates and acid-resistant gaskets.

§ 98.15–30 Cargo piping.

(a) Where special arrangements are approved by the Commandant to permit a pump suction to be lead from the bottom of the tank, the filling and discharge lines shall be fitted with shut-off valves located above the weather deck or operable therefrom.

§ 98.15–35 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent.

§ 98.15–40 Lining.

(a) The interior surfaces of cargo tanks shall be made smooth, welds chipped or ground smooth, and the surfaces thoroughly cleaned before the lining is applied. All interior surfaces of the tanks shall be maintained free from scale, oxidation, moisture and all foreign matter during the lining process.

(b) The rubber or other approved lining material shall be resistive to attack by hydrochloric acid; homogeneous, nonporous, and imperforate when applied; and not less elastic than the metal of the tank proper. It shall be of substantially uniform thickness, not less than ¼ inch for rubber lining. The lining shall be directly bonded to the tank plating, or attached by other satisfactory means acceptable to the Commandant.

(c) Rubber lining shall be scarfed at the joints to overlap at least 1½ inches, and the faying surfaces shall be beveled to an angle of approximately 45 degrees with vulcanizing being done in place.

(d) Cargo piping, including valves, fittings, and flanges, when subject to the corrosive attack of the acid, shall be rubber-lined or coated with other corrosion-resistant material. Vent piping, including flanges and fittings, shall be similarly lined or coated at least to the height of the frangible disc if such is installed.

§ 98.15–45 General requirements.

(a) All enclosed compartments containing hydrochloric acid cargo tanks and all machinery spaces containing cargo pumps for handling hydrochloric acid shall be fitted with effective means of ventilation.

(b) Cargo pumps, piping, valves, fittings, and flanges used in the handling of hydrochloric acid cargo shall be made of material resistive to attack by hydrochloric acid, or shall be suitably protected against such corrosive attack.

(c) A separator shall be fitted in compressed air lines to the tank when air pressure is used to discharge the cargo.

(d) The use of naked lights and artificial lights, other than electric lights or portable battery lights, is prohibited during the filling and discharging operations. Smoking is prohibited and the master or officer in charge of the vessel shall post "No Smoking" signs during filling and discharging operations. All tools used in the loading or unloading operations shall be of the nonsparking type.

(e) A water hose shall be connected ready for immediate use and any leakage or spillage of acid shall be immediately washed down.

(f) Tanks approved for the transportation of hydrochloric acid shall not be used for the transportation of any other commodity, except upon authorization by the Commandant (MMT).

(g) Spent hydrochloric acid or hydrochloric acid adulterated by other chemicals, inhibitors, oils, solvents, water, etc., shall not be transported in bulk cargo tanks except upon authorization by the Commandant (MMT).

(h) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

§ 98.15–50 Tests and inspections.

(a) Each gravity type cargo tank shall be tested before being placed into service as prescribed in § 98.15–10(a).

(b) Each cargo tank shall be subjected to an internal examination at least once in every four years. Where the lining of the cargo tank has deteriorated in service or is not in place, the marine inspector may require such tank to be subjected to the prescribed hydrostatic test if deemed necessary to determine the condition of the tanks.

Subpart 98.20—Liquid Chlorine in Bulk

§ 98.20–1 General.

(a) Liquid chlorine may be carried in bulk in steel tank barges or steel cargo barges in accordance with the provisions of this subpart.

(b) Any barge carrying liquid chlorine in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.20–5 How liquid chlorine may be carried.

(a) Liquid chlorine shall be carried in unfired pressure vessel type tanks independent of the structure of the vessel.

§ 98.20–10 Design and construction of cargo tanks.

(a) The cargo tanks shall meet the requirements of Class I arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) Tanks shall be designed for a pressure of not less than 300 pounds per square inch. For the maximum allowable pressure of tanks in service see § 98.20–75 (c).

(c) Each tank shall be provided with 15 x 18-inch or 18-inch minimum diameter manhole, fitted with a cover located above the maximum liquid level and as close as possible to the top of the tank.

§ 98.20–15 Markings.

(a) Upon satisfactory completion of tests and inspection, the following markings at least three-eighths inch high shall be stamped into a noncorrodible plate permanently attached to the tank by welding.

(Name and address of fabricator)

---p.s.i.
(Design pressure)

---p.s.i.
(Hydrostatic test pressure)

---p.s.i.
(Maximum allowable pressure)

(Inspector's number, initials and C.G. symbol)

(Manufacturer's serial number)

(Date of manufacture)

---U.S. gallons
(Water capacity)

(b) In addition to the markings required to be stamped on the tank, the legend "chlorine" shall be conspicuously and legibly marked upon the dome or upper portion of the tank in letters at least 4 inches high.

(c) All tank inlet and outlet connections, except safety relief valves shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of noncorrodible material may be attached to the valves.

(d) All tank markings shall be permanently and legibly stamped in a readily visible position.

§ 98.20–20 Installation of cargo tanks.

(a) Independent tanks shall be arranged in the barge so as to provide a minimum clearance of not less than 24 inches from the barge side and not less than 15 inches from the barge bottom. Where more than one tank is installed in a barge, the distance between such tanks shall not be less than 15 inches, unless otherwise approved by the Commandant. Alternate provisions may be made for moving such tanks to provide for adequate inspection and maintenance of barge structure and the tanks.

(b) The design shall show the manner in which the tanks are to be installed, supported, and secured on board the barge and shall be approved prior to the installation. Tanks shall be supported in steel saddles and securely anchored in place. No appendages shall be welded to the tanks after they have been stress-relieved unless authorized by the Commandant.

(c) Tanks may be installed "on deck" or "under deck" with the tank protruding above deck. On installations where a portion of the tank extends above the weather deck, provision shall be made to maintain the weather tightness of the deck, except that barges operating on protected inland waters may have tanks located in the holds of hopper type barges without water-tightness of the deck being maintained. All tanks shall be installed with the manhole opening and fittings located above the weather deck.

(d) The hold or holds in which tanks are located "under deck" shall be provided with mechanical ventilation of sufficient capacity to assure a change of air every 3 minutes.

§ 98.20–25 Cargo tanks on barges.

(a) Sides of tank barges shall be fitted with suitable guards as added precaution against the cargo tanks being damaged as a result of collision.

§ 98.20–30 Valves, fittings, and accessories.

(a) All valves, flanges, fittings and accessory equipment shall be of a type suitable for use with chlorine and shall be made of forged steel, cast steel, or nonferrous metal corrosion resistant to chlorine in either the gas or liquid phase. Valves, flanges and fittings shall be of the square or round tongue and groove type or of raised face, American Standard Association 300-pound standard minimum, fitted with sheet lead or other suitable gasket material. Welding fittings shall be used wherever possible, and the number of pipe joints held to a minimum. Screwed joints in cargo lines and vapor lines are prohibited in sizes above 1 inch.

(b) Each tank shall be provided with safety relief valves and with liquid and vapor connections fitted with manually operated shutoff valves. All valves shall be bolted to the cover or covers specified in § 98.20–10(c), and shall be protected against mechanical damage by a suitable protective metal housing. Other openings in tanks are prohibited. A drain connection shall be provided from the protective housing and led overboard just above the deepest load line.

(c) All liquid and vapor connections, except safety relief valves, shall be fitted with automatic excess flow valves, which shall be located on the inside of the tank.

(d) Excess flow valves, where required by this subpart, shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings, and appur-

tenances, protected by excess flow valves shall have a greater capacity than the rated flow of the excess flow valve.

(e) Liquid level gaging devices of any type are prohibited on chlorine tanks.

(f) A pressure gage shall be attached to the vapor shut-off valve or vapor line so as to indicate the pressure in the tank at all times during loading and unloading.

(g) Bypass openings are not permitted in excess flow valves.

§ 98.20–40 Cargo piping.

(a) Piping shall be of seamless drawn black steel of a thickness of not less than schedule 80.

(b) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings. Where necessary, provision shall be made for expansion and contraction of piping by means of seamless steel pipe expansion bends. Slip-type expansion joints are prohibited.

(c) In multiple tank installations the tanks shall not be interconnected by piping or manifolds. More than one cargo tank may be filled or discharged at a time, provided each tank is filled from or discharged to shore tanks through separate lines.

§ 98.20–45 Safety relief valves.

(a) Each tank shall be fitted with one or more approved safety relief valves, designed, constructed, and flow tested for capacity in conformance with Subpart 162.018 in Subchapter Q (Specifications) of this chapter. The safety valve requirements in this section are based on unlagged tanks. On lagged tanks, the Commandant will give special consideration to safety valves proposed to be used.

(b) Each safety relief valve shall be set to pop at a pressure not in excess of the maximum allowable pressure of the tank and shall be vapor tight at a pressure of not less than 80 percent of the maximum allowable pressure.

(c) The safety relief valve(s) shall have a relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the maximum allowable pressure when the safety relief valve(s) is blowing.

(d) The minimum rates of discharge of safety relief valves used on unlagged tanks shall be not less than determined by the following formula:

$$Q = 53.526A^{0.82} \qquad (1)$$

where:

Q = minimum required rate of discharge, in cubic feet per minute, of standard air at 120 percent of the maximum set pressure of the safety relief valve. Discharge measured at 60° F. and atmospheric pressure (14.7 p. s. i. a.).

A = total external surface area of the tank, in square feet. $\pi(D \times U)$, for cylindrical tank with hemispherical heads. $\pi D(U+0.3D)$, for cylindrical tank with spherically dished or semi-ellipsoidal heads. πD^2, for spherical tank.

D = outside diameter of the tank, in feet.

U = external overall length of the tank, in feet.

(e) Safety relief valve(s) shall be attached to the tank near the highest point of the vapor space. Shut-off valves shall not be installed between the tanks and the safety relief valve(s).

(f) Each safety relief valve shall be tested in the presence of an inspector before or after mounting prior to being placed in service. The test shall prove that the safety valve will start to discharge at a pressure not in excess of the maximum allowable pressure of the tank. (For periodic tests see § 98.20–75 (c).)

§ 98.20–50 Filling density.

(a) The filling density, or the percent ratio of the liquefied gas that may be loaded into the tank to the weight of water the tank will hold at 60° F., shall not exceed 125 percent.

§ 98.20–55 Venting.

(a) Cargo tanks of tank barges shall have the safety relief valve outlets connected to individual or common risers which shall extend to a reasonable height above the deck, or, the safety relief valve escape may be led to a common discharge header. Where the escape of vapors from the venting system may interfere with towing operations or the operation of the barge in inland waters would be a hazard to installations extending above deck, an installation acceptable to the Commandant may be used. This arrangement shall be such as to minimize the hazard of escaping vapors.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header as provided in Table 98.20–55 (b).

TABLE 98.20–55 (b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number cargo tanks:	*Percent total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) Return bends and restrictive pipe fittings are prohibited. Vents and headers shall be so installed as to prevent stresses on safety relief valve mountings.

(d) When vent discharge risers are installed, they shall be so located as to provide protection against physical damage and be fitted with loose raincaps.

(e) Suitable provision shall be made for draining the vent escape piping if liquid can collect therein.

§ 98.20–60 Filling and discharge operation.

(a) The maximum amount of liquid chlorine that may be loaded into the cargo tanks shall be determined by weight and shall not exceed the filling density specified in § 98.20–50. Any chlorine vapors vented during the filling operation shall be disregarded when calculating the maximum amount of chlorine to be loaded into the cargo tanks.

(b) Prior to the start of filling operations, care shall be exercised to insure that the cargo tank(s) is empty and free from foreign matter. After all pipe connections and fittings are made tight, the cargo tank(s) shall be evacuated to at least 20 inches of mercury.

(c) The chlorine shall be loaded through a direct pipe line from the shore tank that is mounted on scales so that an amount of chlorine predetermined by weight is loaded into the cargo tank(s) on board the barge.

(d) After the filling operation is completed the vapor above the liquid chlorine in the cargo tank shall be analyzed to determine the percentage of gaseous chlorine in the vapor space. If it should contain less than 80 percent chlorine, vapors shall be withdrawn through the vent or vapor line until the vapor content in the cargo tanks show at least 80 percent chlorine.

(e) After filling connections are removed, upon completion of the loading of a cargo tank, all connections at the tank shall be tested for leakage of chlorine by the aqua ammonia method.

(f) The chlorine in the cargo tanks shall be discharged by the pressure differential method. Where the vapor pressure of the chlorine is not sufficient to force the liquid out of the tank, compressed air may be used to secure the desired rate of discharge, provided the air is oil-free and thoroughly dried by passing it over activated aluminum oxide, silica gel, or other acceptable drying agent. The compressed air system shall contain a relief valve arranged and set so that the air pressure in the cargo tank cannot exceed 70 percent of the allowable pressure of the tank.

(g) After completion of the filling or discharge operations, the excess liquid chlorine in the cargo piping shall be removed. The filling and discharge piping shall be disconnected at the cargo tanks, except during filling and discharge operations. After disconnecting the cargo piping, both ends of the line shall be closed and all inlet and outlet valves on the tank shall be plugged or fitted with blind flanges.

(h) Plans showing alternate methods of filling and discharging the lading may be submitted for approval.

§ 98.20–65 Cargo hose.

(a) Cargo hose fabricated of Schedule 80 seamless black steel pipe, or corrosion resistant metallic pipe not subject to deterioration by chlorine, having metallic flexible joints, or other types of flexible metallic hose acceptable to the Commandant, shall be fitted to the liquid or vapor lines during filling and discharging of the cargo tanks.

(b) Cargo hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tanks.

(c) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be hydrostatically tested by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked with the maximum pressure guaranteed by the manufacturer.

§ 98.20–70 Special operating requirements.

(a) (1) Repairs involving welding or burning shall not be undertaken on the cargo tanks or piping while chlorine in either the liquid or vapor state is present in the system.

(2) Other repairs involving welding or burning equipment may be undertaken on the chlorine barge provided a positive pressure is maintained on the tanks by the vapors remaining after the cargo has been discharged.

(b) During the time chlorine is laden in the tanks the barge shall be under constant surveillance. A towing vessel engaged in towing such barges shall not leave the barge unattended except when the barge is moored at a pier, wharf, dock, or other terminal, and then only if such facility is provided with watchman or guard service. When the barge is at the consignor's or consignee's terminal, watchman or guard service shall be provided by said consignor or consignee.

(c) The Interstate Commerce Commission's standard "Dangerous" placard shall be displayed in four locations on the barge when chlorine is laden in the tanks. A placard shall be posted approximately amidships on each side and facing outboard. A placard shall also be posted on each end of the barge at about the ends of the tanks facing outboard. Racks for mounting such placards shall be so arranged as to provide clear visibility and be protected from becoming readily damaged or obscured. After unloading and before a tank or tanks are gas-freed, the placard shall be reversed to show the "Dangerous—Empty" legend.

(d) (1) At least one approved self-contained breathing apparatus shall be available in a readily accessible location off the barge at all times during the filling and discharge operations. This equipment shall not be considered to be part of the barge equipment, and the barge shall not be required to carry this equipment en route.

(2) The approved self-contained breathing apparatus shall be of a type suitable for starting and operating at the temperatures encountered, and shall be maintained in good operating condition.

(3) Personnel involved in the filling or discharge operations shall be adequately trained in the use of the equipment.

(4) During filling or discharge operations every person on the barge shall carry on his person a respiratory protective device which will protect the wearer against chlorine vapors and provide respiratory protection for emergency escape from a contaminated area which would result from cargo leakage. This respiratory protective equipment shall be of such size and weight that the person wearing it will not be restricted in movement or in the wearing of a life-saving device.

(e) Unless authorized by the Commandant (MMT), no other kind of cargo except liquid caustic soda shall be on board a barge at the same time that chlorine in liquid or vapor state is present in a cargo tank. Chlorine tanks shall not be installed within caustic soda tanks.

(f) Authorization from the Commandant (MMT) shall be obtained to transport lading other than chlorine in tanks of this service.

(g) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 98.20–75 Tests and inspections.

(a) Each cargo tank shall be subjected to an internal and external examination biennially.

(b) Each cargo tank shall be subjected to hydrostatic test biennially of one and one-half times the maximum allowable pressure as determined by the safety relief valve setting.

(c) When periodic inspection indicates that a cargo tank has deteriorated in service, the maximum allowable pressure shall be recalculated, using the minimum thickness found by actual measurement. The recalculated maximum allowable pressure shall be not less than 275 pounds per square inch; otherwise, the cargo tanks shall be withdrawn from service.

(d) The safety relief valves shall be popped in the presence of an inspector by use of water, compressed air, or inert compressed gas at the time of the biennial inspection, or at such time as may be required by the inspector to determine the accuracy of adjustment; and, if necessary, such valves shall be repaired and reset.

§ 98.20–80 Stores on board.

(a) The following substances shall not be used as stores on board barges transporting chlorine in bulk: Hydrogen, methane, liquefied petroleum gases, coal gas, acetylene, ammonia, turpentine, compounds containing metallic powders, finely divided metals or finely divided organic materials.

Subpart 98.25—Anhydrous Ammonia in Bulk

§ 98.25–1 General.

(a) Anhydrous ammonia may be carried in bulk in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying anhydrous ammonia in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter as applicable.

§ 98.25–5 How anhydrous ammonia may be carried.

(a) Anhydrous ammonia shall be carried in unfired pressure vessel type tanks independent of the structure as detailed in this part, except as otherwise provided in paragraph (b) of this section.

(b) When anhydrous ammonia is to be transported at its boiling temperature at or near atmospheric pressure, the Commandant may permit the use of alternate methods of storage if it is shown to his satisfaction that a degree of safety is obtained consistent with the minimum requirements of this subpart.

§ 98.25–10 Design and construction of cargo tanks.

(a) The cargo tanks shall meet the requirements for Class I or Class II arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) Unlagged cargo tanks subject to atmospheric temperatures shall be designed for a pressure of not less than 250 pounds per square inch gage.

(c) Where unrefrigerated cargo tanks are lagged as required by §§ 98.25–30 and 98.25–60, the tanks shall be designed for a pressure of not less than 215 pounds per square inch gage.

(d) Refrigerated cargo tanks, in which the temperature of the liquid ammonia is maintained below the normal atmospheric temperatures, shall be designed for a pressure of not less than the vapor pressure corresponding to the temperature of the liquid at which the system is to be maintained, plus 25 pounds per square inch gage.

(e) Each tank shall be provided with not less than a 15" x 18" diameter manhole, fitted with a cover located above the maximum liquid level and as close as possible to the top of the tank. Where access trunks are fitted to tanks, the diameter of the trunks shall be not less than 30 inches.

(R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, secs. 1, 2, 49 Stat. 1544, as amended; 46 U.S.C. 391, 392, 404, 435, 367)

§ 98.25–15 Markings.

(a) Upon satisfactory completion of tests and inspection, the following marking, at least ⅜ inch high, shall be stamped into a noncorrodible nameplate permanently attached to the tank by means of welding.

(Name and address of fabricator)

---- p.s.i.
(Design pressure)

---- p.s.i.
(Hydrostatic test pressure)

---- p.s.i.
(Maximum allowable pressure)

(CG inspector's number, initials, symbol)

(Manufacturer's serial number)

----U.S. gallons
(Water capacity)

(Date of manufacture)

(b) In addition to the markings required to be stamped on the tank, the legend, "Anhydrous Ammonia" shall be conspicuously and legibly marked upon

the dome or upper portion of the tank in letters at least 4 inches high.

(c) All tank inlet and outlet connections, except safety relief valves, liquid level gaging devices, and pressure gages shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of noncorrosive material may be attached to valves.

(d) All tank markings shall be permanently and legibly stamped in a readily visible position. If the tanks are lagged, the markings attached to the tank proper shall be duplicated on a corrosion resistant plate secured to the outside jacket of the lagging.

§ 98.25–20 Installation of cargo tanks.

(a) Independent tanks shall be arranged in the barge or vessel so as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom. Where more than one tank is installed in a vessel, the distance between such tanks shall be not less than 15 inches, unless otherwise approved by the Commandant. Alternate provisions may be made for moving such tanks to provide for adequate inspection and maintenance of the vessel's structure and the tanks.

(b) The design shall show the manner in which the tanks are to be installed, supported, and secured in the barge or vessel and shall be approved prior to installation. Tanks shall be supported in steel saddles and securely anchored in place. If the tanks are required to be stress-relieved no appendages shall be welded to the tanks after they have been stress-relieved unless authorized by the Commandant.

(c) Tanks may be located in dry cargo holds or in liquid cargo tanks or may be installed "on deck" or "under deck" with the tank protruding above deck. On installations where a portion of the tank extends above the weather deck, provision shall be made to maintain the weathertightness of the deck, except that vessels operating on protected inland waters may have tanks located in the holds of hopper type barges without the watertightness of the deck being maintained. All tanks shall be installed with the manhole opening and fittings located above the weather deck.

(d) The anhydrous ammonia tanks may be installed in the bulk liquid cargo tanks provided the liquid surrounding the enclosed anhydrous ammonia tanks complies with the following chemical and physical properties:

(1) Boiling point above 125° F. at atmospheric pressure.

(2) Inert to ammonia at 100° F. at atmospheric pressure.

(3) Noncorrosive in the liquid and vapor phase to the ammonia tanks and piping.

§ 98.25–25 Cargo tank barges.

(a) Tanks having a cargo capacity of not more than 60,000 gallons may form part of the structure of a barge where adequate provision is made to prevent damage to tanks in the event of collision or grounding.

(b) Sides of tank barges shall be fitted with suitable guards as an added precaution against the cargo tanks being damaged as a result of collision.

§ 98.25–30 Lagging.

(a) Lagged tanks shall be covered with an incombustible insulation material of a thickness to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree F. differential in temperature per hour. The insulating material shall be of an approved type complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter, and shall be given a vapor proof coating with fire retardant material acceptable to the Commandant. Tanks exposed to the weather shall have the insulation and vapor proof coating covered with a removable sheet metal jacket of not less than 0.083 inch thickness and flashed around all openings so as to be weather tight. Materials other than sheet metal may be used to cover the insulation and vapor proof coating when specifically authorized by the Commandant.

(b) Where unlagged tanks are installed in insulated holds or insulated 'tween deck spaces, such tanks shall be considered lagged provided the thermal conductance of the insulation is not less than that required by paragraph (a) of this section.

§ 98.25–35 Refrigerated systems.

(a) Where refrigerated systems are installed to maintain the temperature of the liquid below atmospheric, at least two complete refrigeration plants automatically regulated by pressure variations within the tanks shall be provided, each to be complete with the necessary auxiliaries for proper operation. The capacity of each refrigeration compressor shall be sufficient to maintain the vapor pressure in the tanks during the peak atmospheric temperature conditions below the pressure for which the tanks are designed.

(b) An alternate arrangement may consist of three compressors, any two of which shall be capable of maintaining the vapor pressure in the tanks during peak atmospheric temperature conditions below the pressure for which the tanks are designed, the third compressor acting as a stand-by unit.

(c) Refrigerated tanks shall be insulated in conformance with the requirements of § 98.25–30.

§ 98.25–40 Valves, fittings, and accessories.

(a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with anhydrous ammonia and shall be made of steel, Grade A malleable iron or nodular iron conforming to the requirements of Part 51 of Subchapter F (Marine Engineering) of this chapter. Valves shall be fitted with non-corrosive material suitable for ammonia service. Valves, flanges and pipe fittings shall be of the square or round tongue and groove type or raised-face, American Standard Association 300-pound standard minimum, fitted with suitable soft gasket material. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Screwed joints are not permitted for pipe diameters exceeding two inches. Nonferrous materials, such as copper, copper alloys and aluminum alloys shall not be used in the construction of valves, fittings or accessory equipment. Brazed joints are prohibited.

(b) Each tank shall be provided with the necessary fill and discharge liquid and vapor shut-off valves, safety relief valves, liquid level gaging devices, thermometer well and pressure gage, and shall be provided with suitable access for convenient operation. Connections to tanks installed below the weather deck shall be made to a trunk or dome extending above the weather deck. Tanks installed on hopper barges shall have all pipe connections attached to the top of the tanks. Connections to the tanks shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by this part, are prohibited.

(c) All connections to the tanks, except safety devices and liquid level gaging devices, shall have manually operated shut-off valves located as close to the tank as possible.

(d) Excess flow valves where required by this section shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings and appurtenances, protected by an excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve.

(e) Liquid level gaging devices which are so constructed that outward flow of tank contents shall not exceed that passed by a No. 54 drill size opening, need not be equipped with excess flow valves.

(f) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size.

(g) Excess flow valves may be designed with a bypass, not to exceed a No. 60 drill size opening, to allow equalization of pressure.

(h) Prior to disconnecting shore lines, the pressure in the liquid and vapor lines shall be relieved through suitable valves installed at the loading header.

(i) Relief valves shall be fitted in liquid lines which may be subject to excessive pressure caused by liquid full condition, and the escape from the relief valves shall be piped to the venting system.

(j) The pressure gage shall be located at the highest practical point. The thermometer well shall terminate in the liquid space and be attached to the shell by welding with the end of the fitting being provided with a gas-tight screwed plug or bolted cover.

§ 98.25–45 Liquid level gaging device.

(a) Each tank shall be fitted with a liquid level gaging device of suitable design to indicate the maximum level to which the tank may be filled with liquid at temperatures between 20° F. and 130° F.

(b) Liquid level gaging devices shall be of the following types: magnetic, rotary tube, slip tube, fixed tube, automatic float, or other types acceptable to the Commandant.

(c) Gaging devices that require bleeding of the product to the atmosphere, such as rotary tube, fixed tube, and slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with an excess flow valve.

(d) Gaging devices shall have a design pressure of at least 250 pounds per square inch.

(e) Gage glasses of the columnar type are prohibited.

§ 98.25–50 Filling and discharge pipes.

(a) Filling connections shall be provided with one of the following:

(1) Combination back pressure check valve and excess flow valve;

(2) One double or two single back pressure check valves; or

(3) A positive shut-off valve in conjunction with either an internal back pressure check valve or an internal excess flow valve.

(b) All other liquid and vapor connections to tanks, except filling connections, safety relief valves, and liquid level gaging devices and pressure gages described in § 98.25–40 (e) and (f) shall be equipped with automatic excess flow valves; or in lieu thereof, may be fitted with quick closing internal stop valves, which, except during filling and discharge operations, shall remain closed. The control mechanism for such valves shall be provided with a secondary remote control of a type acceptable to the Commandant.

(c) The excess flow, internal stop or back pressure check valves shall be located on the inside of the tank or outside where the piping enters the tank. In the latter case, installation shall be made in such a manner that any undue strain will not cause breakage between the tank and the excess flow or internal stop valve.

(d) Where the filling and discharge are made through a common nozzle at the tank, and the connection is fitted with a quick-closing internal stop valve as permitted in paragraph (b) of this section, the back pressure check valve or excess flow valve is not required, provided, however, a positive shut-off valve is installed in conjunction with the internal stop valve.

(e) On tanks installed in barges operating on protected inland waters the suction may be taken from the bottom of the tank provided requirements as follows are met:

(1) A manually operated shut-off valve is attached to the outlet nozzle and a remotely operated internal stop valve is fitted inside the tank.

(2) The remotely controlled valve shall be operable from control stations located at each end of the barge so that the remotely controlled valve on any tank can be closed from either station.

§ 98.25–55 Cargo piping.

(a) Piping shall be of seamless drawn black steel of thickness not less than Schedule 40. In case of piping on the discharge side of the liquid pumps or vapor compressors, the design shall be for a pressure of not less than the pump or compressor relief valve setting; or if the piping is not fitted with relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(b) Where necessary, provision shall be made for expansion and contraction of piping by means of seamless steel pipe expansion bends. Special consideration will be given for packless type expansion joints. Slip type expansion joints are prohibited. Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings.

§ 98.25–60 Safety relief valves.

(a) Each tank shall be fitted with two or more approved safety relief valves, designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(b) Each safety relief valve shall start to discharge at a pressure not in excess of the design pressure of the tank.

(c) The safety relief valves shall have a combined relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the maximum allowable pressure when all the safety relief valves are blowing.

(d) (1) The minimum rates of discharge of safety relief valves for uninsulated tanks shall be not less than that determined by the following formula:

$$Q = 21.633A^{0.82} \quad (1)$$

where:

Q = minimum required rate of discharge in cubic feet per minute of standard air at 120 percent of the maximum set pressure of the safety relief valve. Discharge measured at 60° F. and atmospheric pressure (14.7 p.s.i.a.).

A = total external surface area of the tank, in square feet.

$A = \pi(D \times U)$ for cylindrical tanks with hemispherical heads.

$A = \pi D(U + 0.3D)$ for cylindrical tanks with spherically dished or semiellipsoidal heads.

$A = \pi D^2$ for spherical tanks.

D = outside diameter of the tanks, in feet.

U = external overall length of the tank, in feet.

(2) The minimum rate of discharge of safety relief valves for lagged tanks insulated in conformance with § 98.25–30 need only be 50 percent of the capacity required for uninsulated tanks.

(e) Safety relief valves shall be attached to the tank near the highest point of the vapor space. Shut-off valves shall not be installed between the tanks and the safety relief valves, except manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking 3-way valves so arranged at all times as to permit at any position of the 3-way valve, an unrestricted flow of vapors through at least one port. When two safety relief valves are mounted in parallel on both the upper outlets of the 3-way valve, the arrangement shall be such as to permit at least one safety relief valve to be operative at all times.

(f) Each safety valve shall be tested in the presence of an inspector at the site of installation before or after mounting prior to being placed in service. The tests shall prove that the safety relief valve will start to discharge at a pressure not in excess of the maximum allowable pressure of the tank.

§ 98.25–65 Filling density.

(a) The filling density, or the percent ratio of the liquefied gas that may be loaded in the tank to the weight of the water the tank will hold at 60° F., shall not exceed 56 percent for unlagged tanks and 58 percent for lagged or refrigerated tanks.

§ 98.25–70 Venting.

(a) Except as provided in paragraph (b) of this section, each safety valve installed on a cargo tank shall be connected to a branch vent of a venting system which shall be constructed so that the discharge of gas will be directed vertically upward to a point at least 10 feet above the weather deck or the top of any tank or house located above the weather deck.

(b) Safety valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a reasonable height above the deck. Where the escape of vapors from the venting system may interfere with towing operations, the installation shall be acceptable to the Commandant and the arrangement shall be such as to minimize the hazard of escaping vapors. Arrangements specially provided for venting cargo tanks forming part of the hull on unmanned barges will be given special consideration by the Commandant.

(c) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header as provided in Table 98.25–70 (c).

TABLE 98.25–70 (c)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks:	*Percent of total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(d) In addition to the requirement specified in paragraph (c) of this section, the size of the branch vents or vent headers shall be such that the back pressure in relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(e) Return bends and restrictive pipe fittings are prohibited. Vents and headers shall be so installed as to prevent stresses on safety relief valve mountings.

(f) When vent discharge risers are installed, they shall be so located as to provide protection against physical damage and be fitted with loose raincaps.

(g) No shut-off valve shall be fitted in the venting system between the safety relief valve and the vent outlets. Suitable provision shall be made for draining

the venting system if liquid can collect therein.

§ 98.25–75 Ventilation.

(a) All enclosed spaces containing cargo tanks fitted with bottom outlet connections shall be provided with mechanical ventilation of sufficient capacity to assure a change of air every 3 minutes. Where cargo tanks are fitted with top outlet connections, the enclosed spaces containing such tanks shall be fitted with efficient natural or mechanical ventilation.

(b) Enclosed compartments in which machinery such as cargo pumps or vapor compressors are located shall be adequately ventilated.

§ 98.25–80 Cargo hose.

(a) Cargo hose fabricated of seamless steel pipe with swivel joints, wire braided armored rubber or other hose material acceptable to the Commandant, shall be fitted to the liquid or vapor lines during filling and discharging of the cargo tanks.

(b) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(c) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor relief valve.

(d) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be hydrostatically tested by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked with the maximum pressure guaranteed by the manufacturer.

§ 98.25–85 Electrical bonding.

(a) Each cargo tank shall be electrically grounded to the hull. The cargo barge or vessel shall be electrically connected to the shore piping prior to connecting the cargo hose. This electrical connection shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 98.25–90 Special operating requirements.

(a) (1) Repairs involving welding or burning shall not be undertaken on the cargo tanks or piping while anhydrous ammonia in either the liquid or vapor state is present in the system.

(2) Other repairs involving the use of welding or burning equipment may be undertaken on the anhydrous ammonia barge provided a positive pressure is maintained on the tanks by the vapors remaining after the cargo has been discharged.

(b) During the time anhydrous ammonia is laden in the tanks the barge or vessel shall be under constant surveillance. A vessel engaged in towing such barges shall not leave the barge unattended except when the barge is moored at a pier, wharf, dock, or other terminal and then only if such facility is provided with watchman or guard service. When the barge is at the consignor's or consignee's terminal, watchman, or guard service shall be provided by said consignor or consignee.

(c) The Interstate Commerce Commission's standard "Dangerous" placard shall be displayed in four locations on the barge when anhydrous ammonia is laden in the tanks. A placard shall be posted approximately amidships on each side and facing outboard. A placard shall be posted at each end of the barge at about the ends of the tanks facing outboard. Racks for mounting such placards shall be so arranged as to provide clear visibility and be protected from becoming readily damaged or obscured. After unloading and before the tank or tanks are gas-freed, the placard shall be reversed to show the "Dangerous—Empty" legend.

(d) Authorization from the Commandant (MMT) shall be obtained to transport lading other than anhydrous ammonia in the cargo tanks.

(e) Sufficient hose stations shall be installed with adequate water supply so that if leakage of anhydrous ammonia occurs the vapors may be removed by use of a stream of water.

(f) (1) For a manned vessel, at least two units of approved self-contained breathing apparatus, one stowed forward of the cargo tanks and one stowed aft of the cargo tanks, shall be carried on board the vessel at all times.

(2) For an unmanned vessel, at least one approved self-contained breathing apparatus shall be available in a readily accessible location off the vessel at all times during the filling and discharge operations. This equipment shall not be considered to be part of the vessel equipment, and the vessel shall not be required to carry this equipment en route.

(3) All approved self-contained breathing apparatus, masks and respiratory protective devices shall be of types suitable for starting and operating at the temperatures encountered, and shall be maintained in good operating condition.

(4) Personnel involved in the filling or discharge operations shall be adequately trained in the use of the equipment.

(5) For all manned and unmanned vessels, during filling or discharge operations every person on the vessel shall carry on his person or have close at hand at all times a canister mask approved for ammonia; or each person shall carry on his person a respiratory protective device which will protect the wearer against ammonia vapors and provide respiratory protection for emergency escape from a contaminated area which would result from cargo leakage. This respiratory protective equipment shall be of such size and weight that the person wearing it will not be restricted in movement or in the wearing of a lifesaving device.

(g) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 98.25–95 Tests and inspections.

(a) Each cargo tank shall be subjected to an internal examination at least once in each 8 calendar years. Each lagged tank shall be subjected to an external inspection at least once in each 8 calendar years by having the jacket and lagging removed. An external examination of unlagged tanks and the visible parts of lagged tanks shall be made at each biennial inspection.

(b) A hydrostatic test of 1½ times the maximum allowable pressure as determined by the safety relief valve setting shall be made at any time that the inspector considers such hydrostatic test necessary to determine the condition of the tank. If the jacket and lagging are not removed during the hydrostatic tests prescribed in this paragraph, the tank shall hold the hydrostatic test pressure for at least 20 minutes without a pressure drop.

(c) The safety relief valves shall be popped in the presence of a marine inspector by either liquid, gas or vapor pressure at least once every four years to determine the accuracy of adjustment and, if necessary, shall be reset.

Subpart 98.30—Nuclear Energy

§ 98.30–1 Vessels handling radioactive materials.

(a) All vessels handling or processing radioactive materials in substantial amounts other than as cargo shall comply with the applicable requirements in Subpart 57.30 of Subchapter F (Marine Engineering) of this chapter. The regulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(Sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 2, 14 U.S.C. 2, 633. Interpret or apply sec. 14, 29 Stat. 690, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 366, 367, 1333, 390b.)

Subpart 98.35—Portable Tanks for Combustible Liquids

§ 98.35–1 Scope.

(a) The provisions in this subpart contain requirements for the construction, testing, loading, discharging and stowage of portable tanks for the transportation of combustible liquids on board cargo vessels. The regulations apply to portable tank which are capable of being lifted in a loaded condition on and off the vessel. The portable tanks may be filled ashore and then loaded aboard the vessel, or the portable tanks may be loaded and/or discharged after the portable tanks are secured aboard the vessel.

(b) The provisions of this subpart apply to United States' flag vessels subject to the regulations in this chapter and to all foreign vessels when such vessels are on the navigable waters of the United States, its territories and possessions, but

not including the Panama Canal Zone, and which have on board combustible liquid cargo in portable tanks other than in drums, barrels or other packages.

(c) Foreign vessels from countries having similar or equivalent rules or regulations for the design, construction, testing and inspection of portable tanks containing combustible liquids may have such tanks inspected and certified by their own Governments, and such tanks will be considered as meeting such requirements in this subpart; however, such vessels shall comply with §§ 98.35–25, 98.35–30, and 98.35–35 regarding location and stowage, firefighting equipment, and special operating requirements during the transfer of cargo or during the lifting of portable tanks on or off the vessel.

(d) Special consideration may be given to the approval of existing portable tanks which have been authorized prior to March 1, 1963, by the Coast Guard for use on vessels. The Interstate Commerce Commission's approved tank cars and tank trucks (for flammable liquids) and specification ICC–51 portable tanks are accepted as meeting the provisions of this subpart. Except for the ICC containers, all existing portable tanks shall otherwise meet the requirements for testing, inspection, and marking as set forth in this subpart for new tanks.

(e) The regulations covering the transportation in portable tanks of combustible liquids defined as Class B or C poisons are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 98.35–3 Authorization for special commodities.

(a) General authorization is hereby given for paraffinic hydrocarbons to be transported in portable tanks.

(b) Authorization shall be obtained from the Commandant for each seperate commodity, other than paraffinic hydrocarbons, prior to its transportation in portable tanks.

§ 98.35–5 Definitions.

(a) A portable tank, within the meaning of this subpart, is a cargo tank having a capacity greater than 110 gallons and which is independent of the vessel's structure. (See § 90.05–30 of this subchapter for interpretive rulings on portable containers.)

(b) The term "combustible liquids" shall mean any liquid having a flashpoint above 80° F. (as determined in an open-cup tester, as used for test of burning oils).

§ 98.35–7 Plan approval.

(a) Plans in quadruplicate showing the details of construction of portable tanks shall be submitted to the Commandant (MMT), U.S. Coast Guard, 1300 "E" Street NW., Washington, D.C., 20226, for approval.

(b) The plans may be submitted directly to field technical offices.

(1) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for the geographical area covered by 1st, 3d and 5th Coast Guard Districts.

(2) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, New Orleans, La., 70130, for geographical area covered by 2d, 7th and 8th Coast Guard Districts.

(3) Commander, 12th Coast Guard District (mmt), 630 Sansome St., San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th, and 17th Coast Guard Districts.

(c) A manufacturer desiring to construct a portable tank or tanks which are identical with a portable tank previously approved by the Commandant (mmt) shall not be required to submit plans, but shall submit to the Officer in Charge, Marine Inspection, a certificate that the proposed portable tank conforms in every respect with the plans previously approved. Such certificate shall include the manufacturer's serial number, the drawing number or numbers, and the date of approval. If, upon examination, the Officer in Charge, Marine Inspection, ascertains that the said approved plans meet the current requirements of this subpart, the manufacture of such portable tank(s) shall be authorized.

§ 98.35–10 Construction.

(a) Portable tanks shall be designed to be lifted on and off the vessel with contents or otherwise moved from place to place as a normal part of the vessel's operation.

(b) Gravity type portable tanks intended for "on deck" stowage only shall be designed for a head of liquid to the top of the vent, but in no case less than 4 pounds per square inch. Pressure vessel type portable tanks intended for stowage below the weather deck shall be designed for a pressure of not less than 30 pounds per square inch in addition to the head of the liquid. In addition to the internal pressure and liquid head, tanks and handling arrangements shall be designed to withstand the static and dynamic stresses imposed by support and handling operations. Portable tanks designed for pressures exceeding 10 pounds per square inch shall meet the requirements for unfired pressure vessels in Subchapter F (Marine Engineering) of this chapter. When portable tanks are intended for tiering or cellular loading, the structural support shall be designed to carry the stresses due to external loading.

(c) Portable tanks having a horizontal length or width of over 15 feet shall be fitted with a swash bulkhead for each 15 feet of either dimension. Where considered necessary for stability in handling, additional swash bulkheads may be required. The openings in swash bulkheads shall be small enough to effectively prevent surging of the liquid contents.

(d) Each portable tank shall be fitted with not less than a 15-inch by 23-inch or an 18-inch diameter manhole located on the top of the tank. Special consideration may be given to approval of portable tanks which meet applicable ICC specifications with respect to access openings.

(e) All bottom outlets shall be suitably protected against physical damage.

§ 98.35–13 Venting.

(a) Gravity type portable tanks intended for on deck stowage only shall be fitted with gooseneck vents and corrosion resistant flame screens, or with approved pressure-vacuum relief valves set to relieve at pressures not in excess of 4 pounds per square inch.

(b) Pressure vessel type portable tanks intended for on deck stowage only shall be fitted with gooseneck vents and corrosion resistant flame screens, or with approved pressure-vacuum relief valves, or with approved spring loaded relief valves and vacuum relief valves. The settings of all relief valves shall be not more than the design pressure of the tank.

(c) Pressure vessel type portable tanks intended for stowage below the weather deck shall be fitted with an approved vacuum relief valve and with an approved spring-loaded relief valve set at a pressure of not less than 30 pounds per square inch but not in excess of the design pressure of the tank.

(d) The size of all fittings prescribed in paragraphs (a), (b), and (c) of this section shall be not less than the size of the filling line, but in no case less than 2½ inches nominal pipe size. All venting fittings shall be attached at or near the highest point in the vapor space.

§ 98.35–15 Markings.

(a) Each portable tank shall be fitted with a permanent nameplate containing the following:

(Name and address of owner)

(Name and address of manufacturer)

Capacity ---
(U.S. gals.)

Date built ---
(Month, year)

Maximum filling capacity ---
(U.S. gals.)

Maximum design weight ---- lbs.
Light weight ---- lbs.
Design pressure ---- p.s.i.
Test pressure ---- p.s.i.

Initial inspection ---
(Date)

By ---
(Initials of C.G. inspector)

Manufacturer's serial number ---
Tank material ---
Periodic testing ---
(Date and initials of C.G. inspector)

Periodic testing ---
Periodic testing ---

(b) The material for the nameplate shall be of corrosion resistant metal.

(c) The data shall be legibly stamped or embossed and shall not be obliterated during the life of the portable tank. The nameplate shall be maintained in a legible condition so that the data can be easily read.

(d) Portable tanks shall be marked with the legend "COMBUSTIBLE LIQUID." Such legend shall be of letters not less than 3 inches high on a contrasting background and shall be displayed in a conspicuous location on the portable tank when combustible liquids or vapors

are carried therein. When commodities other than paraffinic hydrocarbons are carried, additional markings to indicate the exact material contained in the tank shall be provided.

(e) Pressure vessel type portable tanks designed in accordance with § 98.35–10, vented in accordance with § 98.35–13(c), and specifically approved for stowage below the weather deck in accordance with § 98.35–25(c), shall be marked with the legend "SUITABLE FOR STOWAGE BELOW DECKS." The lettering shall comply with the details of paragraph (d) of this section.

§ 98.35–20 Mounting, lifting and securing arrangements.

(a) *General.* Suitable base, lifting and securing arrangements to withstand service conditions shall be provided.

(b) *Securing devices.* Positive acting securing devices in sufficient number to immobilize the tank unit during any intended passage shall be provided. Due regard shall be given to the dynamic loads imposed by the motion of the vessel while in a seaway. The securing devices shall be sufficient in number and arranged in such a manner that no lashings other than those directly connected to hooks, lugs or padeyes will be necessary.

(c) *Mountings.* (1) Tanks shall be designed and fabricated with mountings to provide a secure base in transit. Skids, saddles, or similar devices shall be deemed to comply with this requirement.

(2) All tank mountings such as skids, fastenings, brackets, cradles, lifting lugs, etc., intended to carry loadings shall be permanently secured to tanks, and shall be designed to withstand static loadings in any direction equal to 1.5 times the weight of the tank and attachments when filled with the lading, using a safety factor of not less than four, based on the ultimate strength of the material to be used.

(3) Lifting lugs or hold-down lugs may be attached to either the tank or tank mountings. If lifting lugs and hold-down lugs are attached directly to the tank, they shall be attached to doubling plates welded to the tank and located at points of support; except that lifting lugs or hold-down lugs with integral bases serving as doubling plates may be welded directly to the tank.

(4) All tank mountings shall be designed so as to prevent the concentration of excessive loads on the tank shell.

§ 98.35–25 Location and stowage.

(a) Except as otherwise provided for in this section, portable tanks shall be stowed on the open weather deck. Portable tanks with open gooseneck vents shall not be located so that their vents, access manholes or other tank openings are within 10 feet of non-explosion proof equipment or openings to spaces containing non-explosion proof equipment.

(b) Tanks containing chemically incompatible cargoes shall be physically separated so that mixing of the cargoes could not occur as a result of a tank failure or an accident during cargo handling.

(c) Upon application to the Commandant, special consideration may be given for the stowage of portable tanks containing combustible liquids below the weather deck, provided the tanks are designed as pressure vessels suitable for a pressure of not less than 30 pounds per square inch and are vented in accordance with § 98.35–13(c).

(d) Combustible liquids transported in Interstate Commerce Commission's approved tank cars and tank trucks (for inflammable liquids) and specification ICC–51 portable tanks (complying with ICC requirements) are considered acceptable for stowage on the open weather deck. Combustible liquids transported in Interstate Commerce Commission's approved tank cars and tank trucks (for inflammable liquids) and specification ICC–51 portable tanks may be stowed below the weather deck, provided it is shown to the satisfaction of the Commandant that a degree of safety is obtained consistent with the minimum requirements of this subpart; and such containers shall meet the requirements of § 98.35–13 for venting and § 98.35–27 for outage.

(e) All tanks located below the weather deck shall be so stowed as to be readily accessible.

§ 98.35–27 Outage.

(a) Sufficient outage shall be provided to prevent the tank from being liquid full at any time, but in no case shall the outage be less than 5 percent for portable tanks intended for on deck stowage and not less than 8 percent for portable tanks intended for stowage below the weather deck.

§ 98.35–30 Firefighting equipment.

(a) The fire hose at each fire hydrant on the cargo vessel in the vicinity of the portable tanks shall be fitted with an approved combination spray nozzle. During loading and unloading operations, the pressure shall be maintained in the fire mains.

(b) The area of the deck in way of each 21,000 U.S. gallons or less of combustible liquids carried at any one time in the portable tanks also shall be protected by one or more approved B–V semiportable foam (40-gals. capacity) or dry chemical (50-lbs. minimum capacity for inside use, 100-lbs. minimum capacity for outside use) fire extinguishers; or alternatively, by a fire hose fitted with an approved portable mechanical foam nozzle with pickup tube and two 5-gallon cans of foam liquid concentrate. When carrying commodities incompatible with the conventional foam system, any foam used shall be of a type suitable for use with the lading. The fire extinguishers shall be located so that the entire area is protected without the need to move the extinguishers, and so as to be accessible in the event of fire occurring in the vicinity of the portable tanks.

§ 98.35–35 Special operating requirements.

(a) *Warning signals.* During transfer of cargo while fast to a dock, a red signal (flag by day and electric lantern at night) shall be so placed that it will be visible on all sides. While transferring cargo at anchor, a red flag only shall be displayed.

(b) *Warning sign at gangway.* A warning placard shall be displayed at each gangway in use while a vessel is fast to a dock during transfer of cargo, to warn persons approaching the gangway. The placards shall state in letters not less than 2 inches high substantially as follows:

WARNING

No open lights

No smoking

(c) *Smoking.* Smoking is prohibited in any open deck or cargo area which is within 50 feet of portable tanks.

(d) *Connecting cargo hose.* Sufficient length of hose shall be used to provide for movement of the vessel whenever a portable tank is filled or discharged while aboard the vessel. Gaskets shall be used in every hose joint and in couplings to pipelines where gasket type couplings are employed; and where bolted flanged joints are used, a sufficient number of bolts shall be used to secure a tight connection. Under no circumstances shall less than three bolts be used in a bolted flanged coupling. When cargo hose is supported by ship's tackle the senior deck officer on duty, or other person in charge when licensed officers are not required, shall see that sufficient tackles are used.

(e) *Inspection prior to transfer of cargo.* Prior to the transfer of cargo the senior deck officer on duty, or other person in charge where licensed officers are not required, shall inspect the vessel to assure himself that the following conditions exist:

(1) Warnings are displayed as required.

(2) No repair work in way of portable tanks is being carried on without his permission.

(3) Riveting, welding, burning or like fire-producing operations shall not be undertaken in the vicinity of portable tanks until an inspection has been made to determine that such operations can be undertaken with safety.

(4) Cargo hose is connected and cargo valves are set, whenever a portable tank is being loaded or discharged while aboard the vessel.

(5) The suitability of cargo handling or lifting gear when a loaded portable tank is being handled.

(f) *Approval to start transfer of cargo.* When the senior deck officer on duty, or other person in charge where licensed officers are not required, has assured himself that the above requirements have been met, he may give his approval to start cargo handling operations.

(g) *Duties of senior deck officer or person in charge.* The senior deck officer on duty, or other person in charge where licensed officers are not required, when a portable tank is loaded or discharged by hose while aboard the vessel, shall control the operations as follows:

(1) Supervise the operations of cargo system valves.

(2) Start transfer of cargo slowly.

(3) Observe hose and connections for leakage.

(4) Observe operating pressure on cargo system.

(5) Observe rate of loading for the purpose of avoiding overflow of tanks.

(h) *Conditions under which transfer operations shall not be commenced or if started shall be discontinued.* Cargo transfer operations shall not be started, or if started, shall be discontinued, under the following conditions:

(1) During severe electrical storms.

(2) If a fire occurs on the wharf or on the vessel or in the vicinity.

(i) *Termination of transfer operations.* When transfer operations involving the transfer of cargo by hose are completed, the cargo hose shall be drained of cargo.

(j) *Maintenance of cargo handling equipment.* The cargo handling equipment shall be maintained in good condition by the vessel's personnel. Cargo hose shall not be used in transfer operations in which the pressures are such that leakage of cargo occurs through the body of the hose.

(k) *Exemptions.* Combustible liquids having a flashpoint of 300° F. or above shall be exempt from the following paragraphs of this section:

(1) Paragraph (b) *Warning sign at gangway.*

(2) Paragraph (e) *Inspection prior to transfer of cargo.*

(3) Paragraph (f) *Approval to start transfer of cargo.*

§ 98.35–40 Electric bonding.

(a) A portable tank, if filled while aboard the vessel, shall be electrically connected to the shore piping, through which the cargo is to be transferred, prior to the connecting of a cargo hose. This electrical connection shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 98.35–45 Initial tests.

(a) Before being placed in service, each portable tank shall be subjected to a hydrostatic test in the presence of a Coast Guard inspector.

(b) For gravity type cargo tanks, the test head pressure shall be not less than the design head pressure prescribed in § 98.35–10(b). For pressure vessel type cargo tanks, the hydrostatic test shall be made at a pressure not less than one and one-half times the design pressure of the tank or the safety relief valve setting, and shall otherwise be conducted in accordance with the testing and inspection requirements for unfired pressure vessels in Subchapter F (Marine Engineering) of this chapter.

(c) It shall be demonstrated by test of a prototype tank of a particular design prior to initial use, that such tank, when loaded at the maximum design weight and with the lifting arrangements provided, has a behavior when lifted which is stable and controllable. This demonstration test shall be made either in the presence of a Coast Guard inspector or by a testing agency acceptable to the Commandant for this purpose.

§ 98.35–50 Periodic tests and inspections.

(a) At least once every 4 years each portable tank shall be subjected to a hydrostatic test to the test pressure as shown on the nameplate, which shall be made in the presence of a Coast Guard inspector. At such time, the tank shall also be internally examined.

(b) No repairs or alterations affecting the safety of the portable tank shall be made without the prior knowledge of the Officer in Charge, Marine Inspection. Notice shall be in accordance with § 91.-45–1 of this subchapter. An inspection either general or partial depending upon the circumstances shall be made whenever any important repairs or alterations are undertaken. The Officer in in Charge, Marine Inspection, may subject the portable tank to the periodic tests as prescribed in paragraph (a) of this section prior to placing such tank back into service.

SUBCHAPTER J—ELECTRICAL ENGINEERING

PART 110—GENERAL PROVISIONS

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Sec.

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110.15–15 Cable terms.
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110.15–40 Corrosion-resistant finishes.
110.15–45 Corrosion-resistant or noncorrodible materials.
110.15–50 Electrochemistry.
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110.15–155 Propulsion engine.
110.15–160 Qualified person.
110.15–165 Rivers.
110.15–170 Recognized classification society.
110.15–175 Rotating machinery; enclosure, ventilation and protection terms.
110.15–177 Rules of the Road.
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Subpart 110.20—Equivalents

110.20–1 Conditions under which equivalents may be used.

Subpart 110.25—Special Provisions

110.25–1 Vessels acquired or documented under the Act of August 9, 1954.
110.25–5 Installations of equipment made during the Unlimited National Emergency declared by the President on May 27, 1941.

AUTHORITY: The provisions of this Part 110 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 110.01—Basis and Purpose of Regulations

§ 110.01–1 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for electrical apparatus and equipment when installed on various types of vessels in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various international conventions for safety of life at sea and other treaties which contain requirements regarding electrical apparatus or equipment. The regulations are necessary to implement the various provisions of law promulgated for the purpose of improving or promoting safety of life at sea.

§ 110.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950, effective July 31,

1950 (15 F. R. 4935, 5 U. S. C. note under 241), the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury with certain specified exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 110.01–10 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally is set forth in R. S. 4405 and 4462, as amended (46 U. S. C. 375 and 416), as well as in other provisions of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto. Under the provisions of R. S. 4403, as amended (46 U. S. C. 372), the Commandant, United States Coast Guard, superintends the administration of the vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations.

(b) *Tank vessels.* The regulations regarding electrical apparatus and equipment which may be used on tank vessels interpret or apply R. S. 4417a and sec. 3 (c) of Public Law 569, 83d Cong., 68 Stat. 676 (46 U. S. C. 391a, 50 U. S. C. 198), as well as Executive Order 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.

(c) *Passenger vessels.* (1) The regulations regarding electrical apparatus and equipment which may be used on passenger vessels interpret or apply R. S. 4399, 4400, 4417, 4418, 4421, 4426, 4433, 4453, and 4488, as amended, section 14, 29 Stat. 690, section 10, 35 Stat. 428, 41 Stat. 305, 49 Stat. 1384, 1544, section 3, 54 Stat. 346, and sec. 3(c), Public Law 569, 83d Cong., 68 Stat. 676 (46 U.S.C. 361, 362, 391, 392, 399, 404, 411, 435, 481, 366, 395, 363, 369, 367, 1333, 50 U.S.C. 198), as well as Executive Order 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.

(d) *Cargo and miscellaneous vessels.* (1) The regulations regarding electrical apparatus and equipment which may be installed on cargo and miscellaneous vessels interpret or apply R. S. 4399, 4400, 4417, 4418, 4421, 4426, 4427, 4433, 4453, and 4488, as amended, section 14, 29 Stat. 690, section 10, 35 Stat. 428, 41 Stat. 305, 49 Stat. 1544, and sec. 3 (c), Public Law 569, 83d Cong., 68 Stat. 676 (46 U. S. C. 361, 362, 391, 392, 399, 404, 405, 411, 435, 481, 366, 395, 363, 367, 50 U.S.C. 198), as well as Executive Order 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.

(e) *Uninspected vessels.* (1) The regulations regarding electrical apparatus and equipment which may be installed on uninspected vessels interpret or apply section 17, 54 Stat. 166, as amended (46 U. S. C. 526p).

(f) *Exemptions.* (1) Public vessels owned by the United States, other than those engaged in commercial service, are to be exempt from the regulations in this subchapter. Certain other vessels may be exempt from the requirements of the regulations in this subchapter when so provided by law.

Subpart 110.05—Application

§ 110.05–1 Vessels subject to the requirements of this subchapter.

(a) This subchapter shall be applicable to all vessels as indicated in columns 3, 4, and 5 of Table 110.05–1(a) and shall apply to all such United States flag vessels, and to all foreign vessels which carry passengers from any port in the United States to the extent prescribed by law, except as follows:

(1) Any vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, and which has on board a current, valid safety certificate.

(2) Any vessel of a foreign nation having inspection laws approximating those of the United States together with reciprocal inspection arrangements with the United States, and which has on board a current, valid certificate of inspection issued by its government under such arrangements.

(3) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(4) Any vessel laid up and dismantled and out of commission.

(5) With the exception of vessels of the U. S. Maritime Administration, any vessel with the title vested in the United States and which is used for public purposes.

TABLE 110.05–1(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2 3 4 5] or Subchapter T—Small Passenger Vessels [2 3 4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2 6]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2 3 6]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.

See footnotes at end of table.

TABLE 110.05–1(a)—Continued

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D–Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [3] [4] [5] or Subchapter T—Small Passenger Vessels [3] [4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [3] [5]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [3] [6]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk. [5]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers. [7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers. [7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

§ 110.05–3 Amendments to the regulations.

(a) The regulations in this subchapter are not retroactive in effect unless specifically provided for in the regulation at the time it is amended or added.

(b) The regulations amended or added subsequent to November 19, 1952, are applicable to installations contracted for on or after the effective date of such regulations.

§ 110.05–5 Specific application noted in text.

At the beginning of the various parts, subparts, and sections, a more specific application is generally given for particular portions of the text involved. This application sets forth the types, sizes or services of vessels to which the text pertains, and in many cases limits the application of the text to vessels contracted for before or after a specific date. As used in this subchapter, the term "vessel contracted for" includes not only the contracting for the construction of a vessel, but also the contracting for a material alteration to a vessel, the contracting for the conversion of a vessel to a passenger vessel, and the changing of service or route of a vessel if such change increases or modifies the general requirements for the vessel or increases the hazards to which it might be subject.

Subpart 110.10—Reference Specifications, Standards, and Codes

§ 110.10–1 General.

The following specifications, standards, and codes, to the extent specified in the text, form a part of this subchapter:

(a) Rules for the Classification and Construction of Steel Vessels, of issue in effect on the date the vessel is contracted for, issued by American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004.

(b) Publications of issue in effect on the date the vessel is contracted for, issued by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, as listed in this paragraph.

(1) The National Electrical Code.

(2) Code for Use of Flammable Anesthetics (Safe Practice for Hospital Operating Rooms).

(c) Standards of issue in effect on the date the vessel is contracted for, issued by National Electrical Manufacturers Association, 155 East 44th Street, New York, N.Y., 10017, as listed in this paragraph.

(1) NEMA Standards Publication Molded Case Circuit Breakers.

(2) NEMA Standards for Large Air Circuit Breakers.

(3) NEMA Standards Publication Motors and Generators (MG1).

(d) Standards of issue in effect on the date the vessel is contracted for, issued by the Institute of Electrical and Electronic Engineers, Box A, Lenox Hill Station, New York, N.Y., 14481, as listed in this paragraph.

(1) AIEE Standard No. 45—Recommended Practice for Electrical Installations on Shipboard.

(2) American Standard Definitions of Electrical Terms, ASA C42.

(e) Standards issued by Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill., 60011, as listed in this paragraph, each of issue in effect on the date the vessel is contracted for:

(1) Standard for Snap Switches.

(2) Standard for Knife Switches.

(3) Standard for Fuses.

(4) Standard for Industrial Control Equipment.

(5) Standard for Branch-Circuit and Service Circuit Breakers.

(6) Standard for Panelboards.

(7) Standard for Edison-Base Lampholders.

(8) Standard for Marine Type Electric Lighting Fixtures.

(9) Standard for Attachment Plugs and Receptacles.

(10) Standard for Flexible Cord and Fixture Wire.

(11) Standard for Electric-Discharge-Lamp Accessory Equipment.

(12) Standard for Elevator Electric Contacts and Elevator Hoistway Door Interlocks.

(13) Standard for Portable Electric Lamps.

(14) Standard for Wire Connectors and Soldering Lugs.

(15) Standard for Outlet Boxes and Fittings.

(16) Standard for Enclosed Switches.

(17) Standard for Commercial Electric Cooking Appliances.

(f) Specifications and Guides issued by the U.S. Navy Bureau of Ships, Washington, D.C., 20360, of issue in effect on the date the vessel is contracted for, as listed in this paragraph.

(1) MIL–C–915 Interim Specifications Cable, Cord and Wire, Electrical (shipboard use).

(2) MIL–C–2194 Military Specifications Cable, Power, Electrical, Reduced Diameter Type, Naval Shipboard.

(3) MIL–C–23206 Military Specifications Cable, Special Purpose, Electrical (Nuclear Plant).

(4) NavShips 250–660–23, Cable Comparison Guide.

(g) Standards of issue in effect on the date the vessel is contracted for, issued by American Standards Association, 70 East 45th Street, New York, N.Y., 10017.

(1) Safety Code for Elevators, Dumbwaiters, and Escalators.

§ 110.10–5 Copies of specifications, standards and codes.

(a) Copies of the specifications, standards, and codes referred to in this subpart may be obtained from the issuing authority except:

(1) Military specifications may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa., 19120.

(2) NavShips 250–660–23 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402.

(b) Copies of the specifications, standards, and codes referred to in this subpart are available for reading purposes at Coast Guard Headquarters upon request.

Subpart 110.15—Definition of Terms Used in This Subchapter

§ 110.15–1 Approved.

This term means approved by the Commandant, United States Coast Guard, unless otherwise stated.

§ 110.15–5 Boat deck.

This term means the deck or decks on which lifeboats are stowed.

§ 110.15–10 Bulkhead deck.

This term means the uppermost deck up to which the transverse watertight bulkheads are carried.

§ 110.15–15 Cable terms.

(a) *Cable.* (1) A cable is either a stranded conductor with or without insulation and other coverings (single conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

(b) *Cable designations.* (1) Abbreviations given in Columns 1 to 5, inclusive, of Table 110.10–15 (b) (1) may be employed in connection with lighting and power, interior communication, and telephone cable. Thus, in the abbreviation DRL–4, D=double conductor, light and power (column 1), R=rubber insulated (column 2), L=leaded and steel armored (columns 3 and 4), and—4=No. 14 American wire gage, 4110 circular mils (column 5). In the abbreviation ICTIA–12, IC=interior communication (column 1), T=thermoplastic-asbestos or thermoplastic-glass-asbestos insulated (column 2), I=impervious sheathed (column 3), A=Aluminum armored (column 4), and —12=12 conductor (column 5).

(2) The trade designations given in Table 110.15–15 (b) (2) may be used to designate the type of flexible cord and fixture wire.

TABLE 110.15–15(b)(1)—LIGHTING AND POWER, INTERIOR COMMUNICATION, AND TELEPHONE CABLE SYMBOLS

Column 1 Symbol designating cable type	Column 2 Symbol designating type of insulation	Column 3 Symbol designating type of outer covering	Column 4 Symbol designating type of armor	Column 5 Symbol designating wire size for light and power cable or number of conductors for interior communication or number of pairs of conductors for telephone cable
S=single conductor, light and power. D=double conductor, light and power. T=triple conductor, light and power. F=four conductor, light and power. IC=interior communication. TT=twisted pair, telephone. TTC=twisted pair, inter-cabin telephone.	R=rubber. V=varnished-cambric. AV=asbestos-varnished-cambric. T=thermoplastic-asbestos or thermoplastic-glass-asbestos. MI=mineral insulated.	A=armored only. L=leaded and armored. I=impervious sheathed and armored. S=reinforced sheathed and armored.	None=steel. A=aluminum. B=bronze.	Circular mil size in thousands, or number of conductors, or number of pairs of conductors.

TABLE 110.15–15 (b) (2)—PORTABLE CORD AND FIXTURE WIRE SYMBOLS

Trade name of wire or cord	Designation	Trade name of wire or cord	Designation
Asbestos-covered heat-resistant fixture wire	AF	Rubber-jacketed heater cord	HSJ
Silicone rubber insulated fixture wire	SF–2	Braided heavy duty cord	K
Silicone rubber insulated fixture wire, flexible stranding	SFF–2	Reinforced cord	P, P–2
Asbestos-covered heat-resistant cord	AFC, AFPD	Twisted portable cord	PD
Rubber-jacketed heat-resistant cord	AFS, AFSJ	Moisture-proof reinforced cord	PW, PW–2
Heat- and moisture-resistant cord	AVPD	Rubber-covered stranded fixture wire	RF–2
Lamp cord	C	Heat-resistant rubber-covered stranded fixture wire	RFH–2
Cotton-covered heat-resistant fixture wire, stranded or flexible stranded	CF	Hard service cord	S
Cotton-covered heat-resistant cord	CFC, CFPD	Hard service cord, oil-resistant	SO
Elevator cable	E, EO, ET	Hard service cord thermoplastic covered	ST
Rubber-covered fixture wire, flexible stranding	FF–2	Junior hard service cord	SJ
Heat-resistant rubber-covered fixture wire, flexible stranding	FFH–2	Junior hard service cord, oil-resistant	SJO
Heater cord	HC, HPD	Junior hard service cord, thermoplastic covered	SJT
Jacketed heater cord	HS	Thermoplastic-covered stranded fixture wire	TF
		Thermoplastic-covered fixture wire, flexible stranding	TFF

§ 110.15–20 Coast Guard District Commander.

This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which includes the inspection, enforcement, and administration of Title 52, Revised Statutes, and Acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 110.15–25 Coastwise.

Under this designation shall be included all vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

§ 110.15–30 Commandant.

This term means the Commandant of the Coast Guard.

§ 110.15–35 Control equipment terms.

(a) *Electric controllers.* An electric controller is a device, or group of devices, which serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(b) *Basic functions.* The basis functions of a controller are the functions of those of its elements which govern the application of electric power to the connected apparatus.

(c) *Manual controller.* A manual controller is an electric controller having all of its basic functions performed by devices which are operated by hand.

(d) *Full magnetic controller.* A full magnetic controller is an electric controller having all of its basic functions performed by devices which are operated by electromagnets.

(e) *Contactor.* A contactor is a device for repeatedly establishing and interrupting an electric power circuit.

(f) *Starter.* A starter is an electric controller for accelerating a motor from rest to normal speed, and to stop the motor.

(g) *Automatic starter.* An automatic starter is a starter in which the influence directing its performance is automatic.

(h) *Autotransformer starter.* An autotransformer starter is a starter which includes an autotransformer to furnish reduced voltage for starting of an alternating current motor. It includes the necessary switching mechanism, and it is frequently called a compensator or autostarter.

(i) *Overload protection (overcurrent protection).* Overload protection is the effect of a device operative on excessive current, but not necessarily on short circuit, to cause and maintain the interruption of current flow to the device governed.

(j) *Overload relay.* An overload relay is an overcurrent relay which functions at a predetermined value of overcurrent to cause disconnection of the load from the power supply.

NOTE: An overload relay is intended to protect the load (for example, motor armature) or its controller, and does not necessarily protect itself.

(k) *Normally open and normally closed.* The terms "Normally Open" and "Normally Closed" when applied to a magnetically operated switching device, such as a contactor or relay, or to the contacts thereof, signify the position taken when the operating magnet is deenergized. These terms apply only to nonlatching types of devices.

(l) *Temperature compensated overload relay.* A temperature compensated overload relay is an overload relay which functions at any current in excess of a predetermined value essentially independent of ambient temperature.

§ 110.15–40 Corrosion-resistant finishes.

The following treatments listed in this section, when properly done and of sufficiently heavy coating, are considered satisfactory corrosion-resistant finishes:

(a) Electroplating of cadmium, chromium, nickel, silver, or zinc.

(b) Sheradizing.

(c) Galvanizing.

(d) Painting. Thorough cleaning and degreasing, followed by bonderizing or the equivalent, followed by the application of zinc chromate primer or the equivalent, followed by one or more applications of enamel.

§ 110.15–45 Corrosion-resistant or noncorrodible materials.

Silver, corrosion-resisting steel, copper, brass, bronze, copper-nickel, certain copper-nickel alloys, and certain aluminum alloys are considered satisfactory corrosion-resistant or noncorrodible materials.

§ 110.15–50 Electrochemistry.

(a) *Storage battery.* A storage battery is a connected group of two or more electrolytic cells for the generation of electric energy in which the cells after being discharged may be restored to a charged condition by an electric current flowing in a direction opposite to the flow of current when the cell discharges.

(b) *Dry cell.* A dry cell is a cell in which the electrolyte is immobilized.

(c) *Primary cell.* A primary cell is a cell which produces electric current by electrochemical reactions without regard to the reversibility of those reactions. (Some primary cells are reversible to a limited extent.)

§ 110.15–55 Embarkation deck.

This term means the deck or decks from which passengers embark into lifeboats or the deck or decks on which passenger as assembled preparatory to embarking into lifeboats.

§ 110.15–60 Emergency squad.

This term means that part of the crew designated by the station bill to form the nucleus of a damage control party.

§ 110.15–65 Equipment enclosure terms.

(a) *Enclosed (inclosed).* Enclosed means surrounded by a case which will prevent a person from accidentally contacting live parts.

(b) *Nonwatertight equipment.* Nonwatertight equipment means enclosed equipment, the enclosure of which is not sufficiently effective to be classed as either drip-proof or watertight.

(c) *Drip-proof equipment.* Drip-proof equipment means enclosed equipment so constructed or protected that its successful operation is not interfered with when subjected to falling moisture or dirt.

(d) *Watertight equipment.* Watertight equipment means enclosed equipment so constructed that a stream of water from a hose (not less than 1 inch in diameter) under a head of about 35 feet from a distance of about 10 feet, and for a period of 5 minutes, can be played on the apparatus without leakage. The hose nozzle should be adjusted to give a solid stream at the enclosure.

(e) *Explosion-proof equipment.* Explosion-proof equipment means equipment enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(f) *Weathertight equipment.* Weathertight equipment means equipment so constructed or protected that exposure to a beating rain will not result in the entrance of water.

(g) *Totally enclosed equipment.* Totally enclosed means so enclosed as to prevent circulation of air between the inside and the outside of the case, but not necessarily sufficiently to be termed airtight.

§ 110.15–70 Equivalent.

This term, when used in connection with a unit, material, process, finish, etc., means the equivalent as determined by the Coast Guard.

§ 110.15–75 Ferry.

Under this designation shall be included those vessels in other than ocean or coastwise service having provisions only for deck passengers and/or vehicles, operating on a short run on a frequent schedule between two points over the most direct water route, and offering a public service of a type normally attributed to a bridge or tunnel.

§ 110.15–80 Flashpoint.

This term indicates the temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester.

§ 110.15–85 Generation and distribution terms.

(a) *Connected load.* The connected load is the sum of the continuous ratings of the load consuming apparatus connected to the system or any part thereof.

(b) *Load factor.* Load factor is the ratio of the average load over a designated period of time to the connected load.

(c) *Peak load.* Peak load is the maximum load consumed or produced by a unit or group of units in a stated period of time. It may be the maximum instantaneous load or the maximum average load over a designated interval of time.

NOTE: Maximum average load is ordinarily used. In commercial transactions involving peak load (peak power) it is taken as the average load (power) during a time interval of specified duration occurring within a given period of time, that time interval being selected during which the average power is greatest.

(d) *Ground (earth).* A ground is a conducting connection, whether intentional or accidental, by which an electric circuit or equipment is connected to the earth, or to some conducting body, of relatively large extent, which serves in place of the earth. It is used for establishing and maintaining the potential of the earth (or of the conducting body) or approximately that potential, on conductors connected to it, and for conducting ground current to and from the earth (or the conducting body).

NOTE: On shipboard the "ground" or "earth" is the metal hull and all conductive parts connected thereto.

(e) *Grounded (earthed).* Grounded means that the system, circuit, or apparatus referred to is produced with a ground.

(f) *Ground-return circuit (earth-return circuit).* A ground-return circuit in which the earth is utilized to complete the circuit.

(g) *Ground current.* Ground current is current flowing in the earth or in a grounding connection.

(h) *Voltage to ground.* The voltage to ground is the voltage between any live conductor of a circuit and the earth.

NOTE: Where safety considerations are involved, the voltage to ground which may occur in an ungrounded circuit is usually the highest voltage normally existing between the conductors of the circuit, but in special circumstances higher voltages may occur.

(i) *Ground indication.* A ground indication is an indication of the presence of a ground on one or more of the normally ungrounded conductors of a system.

(j) *Circuit.* A circuit is a conducting part or a system of conducting parts through which an electric current is intended to flow.

(k) *Feeder (in interior wiring).* A feeder is a set of conductors originating at a main distribution center, and supplying one or more secondary distribution centers, one or more branch-circuit distribution centers, or any combination of these two types of equipment.

(l) *Lighting feeder.* A lighting feeder is a feeder supplying principally a lighting load.

(m) *Power feeder.* A power feeder is a feeder supplying principally a power or heating load.

(n) *Branch circuit.* A branch circuit is that portion of a wiring system extending beyond the final overcurrent device protecting the circuit.

(o) *Motor branch circuit.* A motor branch circuit is a branch circuit supplying energy only to one or more motors and associated motor controllers.

(p) *Lighting branch circuit.* A lighting branch circuit is a circuit supplying energy to lighting outlets only. (Lighting branch circuits also may supply portable desk or bracket fans, small heating appliances, motors of ¼ hp and less, and other portable apparatus of not over 660 watts each.)

(q) *Appliance branch circuit.* An appliance branch circuit is a circuit supplying energy to one or more outlets to which appliances are to be connected; such circuits to have no permanently-connected lighting fixtures not a part of an appliance.

(r) *Outlet.* An outlet is a point on the wiring system at which current is taken to supply fixtures, lamps, heaters, motors, or current-consuming equipment generally.

NOTE: The use of the term outlet for a point in the wiring system where a switch is located is deprecated, unless qualified to make the meaning clear.

(s) *Lighting outlet.* A lighting outlet is an outlet intended for the direct connection of a lampholder, a lighting fixture or a pendant cord terminating in a lampholder.

(t) *Receptacle outlet.* A receptacle outlet is an outlet intended to be equipped with one or more receptacles, not of the screw-shell type, or provided with one or more points of attachment within one foot, intended to receive attachment plugs.

(u) *Plug (plug adaptor).* An attachment plug is a device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(v) *Appliance.* Appliances are current-consuming equipment, fixed or portable; for example, heating, cooking and small motor-operated equipment.

(w) *Portable appliance.* A portable appliance is an appliance, fixed or portable, served by means of a flexible extension cord and/or attachment plug.

(x) *Accessible (as applied to wiring methods).* Accessible means not permanently closed in by the structure or finish of the ship; capable of being removed without disturbing the ship structure or finish.

(y) *Accessible (as applied to equipment).* Accessible means admitting close approach because not guarded by locked doors, elevation or other effective means.

§ 110.15–90 Great Lakes.

Under this designation shall be included all vessels navigating the Great Lakes.

§ 110.15–95 Headquarters.

This term means the office of the Commandant, U.S. Coast Guard, Washington, D.C., 20226.

§ 110.15–100 Instrument and meter terms.

(a) *Instrument.* An instrument is a device for measuring the value of the quantity under observation. An instrument may be an indicating instrument or a recording instrument. The term "instrument" is used in two different senses: (1) Instrument proper consisting of the mechanism and the parts built into the case or made a corporate part thereof, and (2) the instrument proper together with any necessary auxiliary devices, such as shunt, shunt leads, resistors, reactors, capacitors or instrument transformers. The term "meter" is also used in a general sense to designate any type of measuring device, including all types of electric measuring instruments. Such use as a suffix or as part of a compound word (e.g., voltmeter, frequency meter) is universally accepted. Meter may be used alone with this wider meaning when the context is such as to prevent confusion with the narrower meaning of electricity meter.

(b) *Indicating instrument.* An indicating instrument is an instrument in which only the present value of the quantity measured is visually indicated.

(c) *Ammeter.* An ammeter is an instrument for measuring the magnitude of an electric current. It is provided with a scale, usually graduated in either amperes, milliamperes, microamperes or kiloamperes. If the scale is graduated in milliamperes, microamperes or kiloamperes, the instrument is usually designated as a milliammeter, a microammeter or a kiloammeter.

(d) *Frequency meter.* A frequency meter is an instrument for measuring the frequency of an alternating current.

(e) *Power-factor meter.* A power-factor meter is a direct-reading instrument for measuring power factor. It is provided with a scale graduated in power factor.

(f) *Voltmeter.* A voltmeter is an instrument for measuring the magnitude of electric potential difference. It is provided with a scale, usually graduated in either volts, millivolts, or kilovolts. If the scale is graduated in millivolts or kilovolts the instrument is usually designated as a millivoltmeter or a kilovoltmeter.

(g) *Wattmeter.* A wattmeter is an instrument for measuring the magnitude of the active power in an electric circuit. It is provided with a scale usually graduated in either watts, kilowatts, or megawatts. If the scale is graduated in kilowatts or megawatts, the instrument is usually designated as a kilowattmeter or megawattmeter.

(h) *Instrument shunt.* An instrument shunt is a particular type of resistor designed to be connected in parallel with a circuit of an instrument to extend its current range. The shunt may be internal or external to the instrument proper.

§ 110.15–105 International voyage.

(a) The term "international voyage," as used in this subchapter, shall have the same meaning as that contained in Regulation 2(d), Chapter I, of the International Convention for Safety of Life at Sea, 1960; i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purpose of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) Although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purpose of this subchapter.

§ 110.15–110 Lakes, bays, and sounds.

Under this designation shall be included all vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

§ 110.15–115 Locations.

(a) *Corrosive location.* Corrosive locations shall be deemed to be locations exposed to the weather on vessels operating in salt water.

(b) *Damp or wet location.* Damp or wet locations shall be deemed to be locations exposed to the weather, machinery

spaces, cargo spaces, refrigerated spaces, galley, laundry, public washrooms or toilets equipped with baths or showers, and similar locations. Areas directly inside of access doors to a weather deck will also be classed as wet locations where the access door is not suitably protected against entrance of rain or spray by an overhanging deck or by other means.

(c) *Dry location.* Dry locations shall be deemed to be passengers' and crew's quarters, pantries, passageways adjacent to quarters, public washrooms and toilets which are not equipped with baths or showers, radio room, gyro room, and chart room.

§ 110.15–120 Marine inspector or inspector.

These terms means any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, R.S., and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 110.15–125 Motorboat.

This term means any vessel indicated in Columns 4 or 5 of Table 110.05–1(a), 65 feet in length or less which is propelled by machinery (including steam). The length shall be measured from end to end over the deck excluding sheer. This term includes a boat temporarily or permanently equipped with a detachable motor and any such boat when so propelled is subject to the applicable provisions of the Act of April 25, 1940, as amended (secs. 1 to 22, 54 Stat. 163–167, as amended, 46 U.S.C. 526–526u), and the regulations promulgated thereunder. For the purpose of this subchapter motorboats are included under the term "vessel" unless specifically noted otherwise. The various classes of motorboats are as follows:

Class A—Any motorboat less than 16 feet in length.
Class 1—Any motorboat 16 feet or over and less than 26 feet in length.
Class 2—Any motorboat 26 feet or over and less than 40 feet in length.
Class 3—Any motorboat 40 feet or over and not more than 65 feet in length.

§ 110.15–128 Nuclear vessel.

(a) A nuclear vessel is a vessel provided with a nuclear powerplant for propulsion or any other purpose, or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

§ 110.15–130 Ocean.

Under this designation shall be included all vessels navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

§ 110.15–135 Officer in Charge, Marine Inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 110.15–140 Passenger.

A passenger is every person other than the master and members of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel. In the case of a vessel on an international voyage a child under one year of age is not counted as a passenger.

§ 110.15–155 Propulsion engine.

This term means one or more machines driving a single propeller or paddlewheel shaft for propulsion of the vessel.

§ 110.15–160 Qualified person.

(a) A qualified person is one who by his special knowledge, ability, and experience is able to competently and safely perform the required functions and duties.

§ 110.15–165 Rivers.

Under this designation shall be included all vessels whose navigation is restricted to rivers and/or canals, exclusively, and to such other waters as may be so designated by the Coast Guard District Commander.

§110.15–170 Recognized classification society.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

§ 110.15–175 Rotating machinery; enclosure, ventilation and protection terms.

(a) *Self-ventilated machine.* A self-ventilated machine is one which has its ventilating air circulated by means integral with the machine.

(b) *Separately ventilated machine.* A separately ventilated machine is one which has its ventilating air supplied by an independent fan or blower external to the machine.

(c) *Enclosed self-ventilated machine.* An enclosed self-ventilated machine is a machine having openings for the admission and discharge of the ventilating air, which is circulated by means integral with the machine, the machine being otherwise totally enclosed. These openings are so arranged that inlet and outlet ducts or pipes may be connected to them.

NOTE: Such ducts or pipes, if used, must have ample section and be so arranged as to furnish the specified volume of air to the machine, otherwise the ventilation will not be sufficient.

(d) *Enclosed separately ventilated machine.* An enclosed separately ventilated machine is a machine having openings for the admission and discharge of the ventilating air, which is circulated by means external to and not a part of the machine, the machine being otherwise totally enclosed. These openings are so arranged that inlet and outlet duct pipes may be connected to them.

(e) *Open machine.* An open machine is one having ventilating openings which permit passage of external cooling air over and around the windings.

(f) *Totally enclosed machine.* A totally enclosed machine is one so enclosed as to prevent exchange of air between the inside and the outside of the case, but not sufficiently enclosed to be called airtight.

(g) *Totally enclosed fan-cooled machine.* A totally enclosed fan-cooled machine is a totally enclosed machine equipped for exterior cooling by means of a fan or fans, integral with the machine but external to the enclosing parts.

(h) *Protected machine.* A protected machine is an open machine in which all openings giving direct access to live or rotating parts (except smooth shafts) are limited in size by the design of the structural parts, or by screens, grilles, expanded metal, etc., to prevent accidental contact with such parts. Such openings are of such size as not to permit the passage of a cylindrical rod ½ inch in diameter, except where the distance from the guard to the live or rotating parts is more than 4 inches they are of such size as not to permit the passage of a cylindrical rod ¾ inch in diameter.

(i) *Drip-proof machine.* A drip-proof machine is one in which the ventilating openings are so constructed that drops of liquid or solid particles falling on the machine at any angle not greater than 15 degrees from the vertical, cannot enter the machine either directly or by striking and running along a horizontal or inwardly inclined surface.

(j) *Explosion-proof machine.* An explosion-proof machine is one enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(k) *Waterproof machine.* A waterproof machine is a totally enclosed machine so constructed that a stream of water from a hose (not less than 1 inch in diameter) under a head of 35 feet and from a distance of about 10 feet can be played on the machine from any direction for a period of 15 minutes without leakage, except that leakage which may occur around the shaft may be considered permissible, provided it is prevented from entering the oil reservoir and provision is made for automatically draining the machine. The hose nozzle should be adjusted to give a solid stream at the enclosure. The machine should be provided with a check valve for drainage or a tapped hole at the lowest part of the frame which will serve for application of drain pipe or drain plug.

§ 110.15–177 Rules of the Road.

(a) The term "Rules of the Road" means the statutory and regulatory rules

governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 110.15–180 Short international voyage.

For the purpose of this subchapter, the expression "short international voyage" means an international voyage in the course of which a vessel is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety, and which does not exceed 600 miles in length between the last port of call in the country in which the voyage begins and the final port of destination.

§ 110.15–185 Switching equipment.

(a) *Switches*—(1) *Switch.* A switch is a device for making, breaking or changing the connections in an electric circuit.

(2) *Knife switch.* A knife switch is a form of air switch in which the moving element, usually a hinged blade, enters or embraces the contact clips. In some cases, however, the blade is not hinged and is removable.

(3) *Rated continuous current (of a switch or circuit breaker).* The rated continuous current of a switchgear device, or an assembly, is the maximum direct current, or rms current, in amperes at rated frequency which it will carry continuously without exceeding the limit of observable temperature rise.

(4) *Rated voltage (of a switch or circuit breaker).* The rated voltage of a device, or an assembly, is the voltage to which its operating and performance characteristics are referred.

(5) *General use switch.* A general use switch is a switch intended for use in general distribution and branch circuits. It is rated in amperes and is capable of interrupting the rated current at the rated voltage.

(6) *Isolating switch.* An isolating switch is a switch intended for isolating an electric circuit from the source of power. It has no interrupting rating and is intended to be operated only after the circuit has been opened by some other means.

(7) *Motor-circuit switch.* A motor-circuit switch is a switch intended for use in a motor branch circuit. It is rated in horsepower and is capable of interrupting the maximum operating overload current of a motor of the same rating at the rated voltage.

(8) *"T" rated switch.* A "T" rated switch is a switch intended to control tungsten-filament lamp loads.

(9) *Master switch.* A master switch is a switch which dominates the operation of contactors, relays, or other remotely operated devices.

(b) *Interrupting devices*—(1) *Circuit breaker.* A circuit breaker is a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions.

NOTE: Ordinarily circuit breakers are required to operate relatively infrequently, although some classes of breakers are suitable for frequent operation.

NOTE: Normal indicates the interruption of currents not in excess of the rated continuous current of the circuit breaker. Abnormal indicates the interruption of currents in excess of such rated continuous current, such as short circuits.

(2) *Rated interrupting current (rated interrupting capacity).* The rated interrupting current of a circuit breaker is the highest current which the breaker is rated to interrupt at rated voltage and under specified operating duty. (As applied to breakers which allow the current to reach its maximum value, the rated interrupting current is the current at the start of the interrupting process. As applied to breakers which prevent the current from reaching its maximum value, the rated interrupting current is the highest available current of the circuit which the breaker is rated to interrupt).

(3) *Reverse-power tripping.* Reverse-power tripping signifies the tripping of a circuit breaker upon reversal of power in the main circuit.

NOTE: In direct-current practice the terms "reverse power" and "reverse current" are synonymous.

(4) *Undervoltage tripping.* Undervoltage tripping signifies the tripping of a circuit breaker by automatic means when the main circuit voltage decreases to a predetermined value.

(5) *Nonautomatic tripping.* Nonautomatic tripping signifies the tripping of a circuit interrupter only in response to an act of an operator.

(c) *Fuses*—(1) *Fuse.* A fuse is an overcurrent protective device with a circuit opening fusible member which is heated and severed by the passage of overcurrent through it.

(2) *Voltage rating.* The voltage rating of a fuse is the rms alternating or direct voltage for which it is designed.

(3) *Current rating.* The current rating of a fuse is the designated rms alternating, or direct current which it will carry continuously under stated conditions.

(d) *Relays*—(1) *Relay.* A relay is a device that is operative by a variation in the conditions of one electric circuit to effect the operation of other devices in the same or another electric circuit.

NOTE: Where relays operate in response to changes in more than one condition, all functions should be mentioned.

(2) *Current relay.* A current relay is one that functions at a predetermined value of current. It may be an overcurrent relay, an undercurrent relay, a combination of both.

(3) *Overload relay.* An overload relay is an overcurrent relay which functions at a predetermined value of overcurrent to cause disconnection of the load from the power supply.

NOTE: An overload relay is intended to protect the load (for example, motor armature) or its controller, and does not necessarily protect itself.

(4) *Voltage relay.* Voltage relay is one that functions at a predetermined value of voltage. (It may be an overvoltage relay, an undervoltage relay, or a combination of both).

(5) *Instantaneous.* Instantaneous is a qualifying term applied to a relay indicating that no delay is purposely introduced in its action.

(6) *Inverse time.* Inverse time is a qualifying term applied to a relay indicating that its time of operation decreases as the magnitude of the operating quantity increases.

(7) *Overcurrent protection (overload protection).* Overcurrent protection operates to disconnect the protected equipment on excessive current.

(8) *Undervoltage protection (lowvoltage protection).* Undervoltage or lowvoltage protection is the effect of a device operative on the reduction or failure of voltage to cause and maintain the interruption of power in the main circuit.

(9) *Undervoltage release (lowvoltage release).* Undervoltage or lowvoltage release is the effect of a device operative on the reduction or failure of voltage to cause the interruption of power in the main circuit, but not to prevent the reestablishment of the main circuit on return of voltage.

(10) *Overspeed protection.* Overspeed protection operates to disconnect the protected equipment when the speed of rotation is in excess of a predetermined amount.

(e) *Regulators*—(1) *Regulator.* A regulator is a device which functions to maintain a designated characteristic at a predetermined value, or to vary it according to a predetermined plan.

(2) *Generator voltage regulator.* A generator voltage regulator is a regulator which functions to maintain the voltage of a synchronous generator, condenser, motor, or of a direct-current generator, at a predetermined value, or vary it according to a predetermined plan.

(f) *Switchgear assemblies*—(1) *Power switchboard.* A power switchboard is a type of switchboard including main circuit switching and interrupting devices, together with their interconnections.

(2) *Live-front switchboards.* A live-front switchboard is one having exposed live parts on the front.

(3) *Dead-front switchboard.* A dead-front switchboard is one having no exposed live parts on the front, which constitutes a grounded metal barrier between the operator and the apparatus.

(4) *Distribution switchboard.* A distribution switchboard is a power switchboard used for the distribution of electric energy at the voltages common for such distribution within a ship.

NOTE: Knife switches, air circuit breakers, and fuses are generally used for circuit interruption on distribution switchboards, and voltages seldom exceed 600. However, such switchboards often include switchboard equipment for a high tension incoming supply circuit and a stepdown transformer.

(5) *Automatic transfer equipment.* An automatic transfer equipment is one which automatically transfers a load so that a source of power may be selected from two or more incoming lines.

§ 110.15–190 Vessel.

(a) Where the word "vessel" is used in this subchapter, it shall be considered to include all vessels indicated in Columns 3, 4, and 5 of Table 110.05–1(a) except as otherwise noted.

(1) *Cargo vessel.* Where the term "cargo vessel" is used in this subchapter it shall be considered to include all vessels indicated in Column 5 of Table 110.05–1 (a) except as otherwise noted.

(2) *Passenger vessel.* Where the term "passenger vessel" is used in this subchapter it shall be considered to include all vessels indicated in Column 4 of Table 110.05–1 (a) except as otherwise noted.

(3) *Tank barge; tank ship; tank vessel.* For definitions of these terms as used in this subchapter, see § 111.70–5 (i), (j), and (k) of this subchapter.

(4) *Barge.* Where the term "barge" is used in this subchapter, it shall be considered to include all nonself-propelled vessels.

§ 110.15–195 Western rivers.

For the purpose of this subchapter, the term "western rivers" is as defined in CG–184, "Rules of the Road—Western Rivers."

Subpart 110.20—Equivalents

§ 110.20–1 Conditions under which equivalents may be used.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided,* That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such condition as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

Subpart 110.25—Special Provisions

§ 110.25–1 Vessels acquired or documented under the Act of August 9, 1954.

(a) Vessels acquired or documented under the Act of August 9, 1954 (sec. 3, 68 Stat. 675, 50 U.S.C. 198), shall be subject to the applicable provisions of Title 52 of the Revised Statutes, acts amendatory thereto and the rules and regulations thereunder.

(b) Unapproved lifesaving, firefighting, and other equipment may be continued in service so long as, in the opinion of the Officer in Charge, Marine Inspection, such equipment is in good and serviceable condition. All replacements shall be in accordance with Coast Guard requirements for new vessels.

§ 110.25–5 Installations of equipment made during the Unlimited National Emergency declared by the President on May 27, 1941.

Boilers, pressure vessels, machinery, piping, electrical, and other installations, including lifesaving, firefighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec. 501, 56 Stat. 180, 50 U. S. C., App. Sup. 635), which do not fully meet the detail requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

PART 111—ELECTRICAL SYSTEM; GENERAL REQUIREMENTS

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AUTHORITY: The provisions of this Part 111 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 111.01—Application

§ 111.01-1 General.

(a) The provisions of this part, with the exception of Subpart 111.90 of this part, shall, unless otherwise indicated, apply to all vessels contracted for on or after November 19, 1952. The provisions of Subpart 111.90 of this part shall apply to all vessels contracted for prior to November 19, 1952.

CROSS REFERENCE: See § 110.05-3 of this subchapter for application of amendments to regulations.

§ 111.01-5 Should; meaning of.

(a) In order to have, wherever possible in this part, the identical wording contained in Section 35 of the American Bureau of Shipping Rules for the Classification and Construction of Steel Vessels, the word "should" has been used instead of "shall". Therefore, in each such instance where this word "should" is used in this part (except §§ 111.05-10 (c), 111.05-10 (d) and 111.05-10 (f)) to describe, or as applicable to, the equipment or installation, this word is to be considered the same as the word "shall" in describing Coast Guard requirements.

Subpart 111.05—General Requirements

§ 111.05-1 Construction and installation.

(a) Electrical apparatus and wiring systems shall be in accordance with the requirements of this part. The requirements of this part are applicable to all vessels but may be modified by the Commandant for vessels certificated for limited service or for vessels less than 300 gross tons. The requirements of this part are minimum requirements and it is recommended that details not covered by the regulations be in general conformity with Standard No. 45 of the American Institute of Electrical and Electronic Engineers. (See § 110.10-1(e) of this subchapter.)

§ 111.05-5 Plan approval.

(a) *General.* (1) The required plans listed in this subpart are general in character, but include all plans which normally show construction and safety features coming under the cognizance of the Coast Guard. In the case of a particular vessel, all of the plans enumerated may not be applicable, and it is intended that only those plans and specifications be submitted as will clearly show the vessel's arrangement, construction and required equipment.

(2) In the list of required plans given in this section, those indicated by an asterisk cover the electrical items necessary for the approval of the installation by the American Bureau of Shipping for vessels classed by that organization. When prints bearing record of such approval by the American Bureau of Shipping are forwarded to the Coast Guard, they will, in general, be accepted as satisfactory except insofar as the law or the regulations in this chapter contain requirements which are not covered by the American Bureau of Shipping.

(b) *Procedure for submittal of plans.* (1) As the relative locations of shipyards, design offices, and Coast Guard offices vary throughout the country, no specific routing will be required in the submittal of plans. In general, one of the procedures outlined in this paragraph would apply, but in a particular case, if a more expeditious procedure can be used, there will be no objection to its adoption.

(2) The plans may be submitted to the Officer in Charge, Marine Inspection, at or nearest the place where the vessel is to be built. This procedure wil be most expeditious in the case of those offices where personnel and facilities are available for examination and approval of the plans locally.

(3) The plans may be submitted directly to the Commandant (MMT), U. S. Coast Guard, 1300 E Street, NW., Washington, D.C., 20226. In this case, the plans will be returned directly to the submitter, with a copy of the action being forwarded to the interested Officer in Charge, Marine Inspection.

(4) The plans may be submitted directly to field technical offices.

(i) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for the geographical area covered by 1st, 3d and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, New Orleans, La., 70130, for geographical area covered by 2d, 7th and 8th Coast Guard Districts.

(iii) Commander, 12th Coast Guard District (mmt), 630 Sansome Street, San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th and 17th Coast Guard Districts.

(5) In the case of classed vessels, upon specific request by the submitter, the American Bureau of Shipping will arrange to forward the necessary plans to the Coast Guard indicating its action thereon. In this case, the plans will be returned as noted in subparagraph (3) of this paragraph.

(c) *Number of plans required.* (1) Four copies of each plan are normally required so that one can be returned to the submitter. If the submitter desires additional approved plans, a suitable number should be submitted to permit the required distribution.

(d) *Electrical plans required for new construction.*[1] (1) Specifications.

(2)* General Arrangements.

(3)* Switchboard front, rear, end, and section views.

(4)* Switchboard wiring diagram.

(5)* Switchboard material and nameplate list.

(6) Elementary wiring diagram of metering and automatic switchgear.

(7)* Description of operation of propulsion control and bus transfer switchgear.

(8) * Elementary (one line) wiring diagram of power system (supplemented by cable lists, panelboard summaries, etc., if desired) giving:

(i)* Type and size of generators;

(ii)* Type and size of generator cables, bus-tie cables, feeders, and branch circuit cables;

(iii) Power, lighting, and interior communication panelboards showing number of circuits and rating of energy consuming devices;

(iv) Type and capacity of storage batteries;

[1] The items marked with an asterisk (*) indicate such items may require the approval of the American Bureau of Shipping.

(v)* Rating of circuit breakers and switches, interrupting capacity of circuit breakers, and rating or setting of overcurrent devices.

(9)* Electric plant summary showing connected loads and calculated operating loads for various conditions of operation.

(10)* Isometric or deck wiring plans of power system, including symbol list.

(11) Elementary wiring diagram of steering gear alarm circuits and ventilation shut-down control.

(12) Elementary wiring diagram and isometric or deck wiring diagrams of electric watertight door system, fire screen door holding system, and power operated lifeboat winches.

(13)* Generators, propulsion motors, and vital auxiliary motors. Manufacturer's outline drawing of each giving nameplate data, degree of enclosure, type of insulation, temperature rise above stated ambient temperature, duty cycle, and application or name of auxiliary driven. Vital motors are those essential, or those which are part of a system that is essential, to the safe operation and navigation of the vessel. Examples of such vital auxiliary motors are propulsion auxiliary motors, steering gear motors, fire and bilge pump motors, motors driving emergency M–G sets, etc.

(14)* Motor starters. Manufacturer's enclosure outline drawing, control elementary wiring diagram, and application of each. For lifeboat winch motor starters, see § 111.65–40.

(15) Distribution panelboards, branch boxes, enclosed switches, pushbutton stations, control switches, etc. Manufacturer's outline drawing or suitable identification on deck wiring plan symbol list. For lifeboat winch control switches, see § 111.65–40.

(16) Isometric or deck wiring plan of lighting feeders.

(17)* Deck plans of lighting system showing location of cables, fixtures, and wiring devices, cable sizes and types, and manufacturer's name and identification of fixtures and wiring devices. If manufacturer's name and identification are contained in a symbol list, the corresponding symbol marking should be employed on the deck plans.

(18) Elementary and isometric or deck wiring diagrams of engine order telegraph system, sound powered telephone system, general alarm system, emergency loudspeaker system, rudder angle indicator system, shaft speed indicator system, gyro compass system, gyro pilot system, radio system, radar plan position indicator system, loran system, refrigerated spaces alarm system, etc., with material identified by name of manufacturer and drawing and/or catalog number. If manufacturer's name and identification are contained in a symbol list, the corresponding symbol marking should be employed on the deck plans.

(19) Elementary and deck wiring plans of fire detecting and alarm system, manual alarm system, smoke detecting system, carbon dioxide extinguishing system alarms, and supervised patrol system, with material identified by name of manufacturer and drawing and/or catalog number. If manufacturer's name and identification are contained in a symbol list, the corresponding symbol marking should be employed on the deck plans.

(e) *Electrical plans required for repairs and alterations of existing vessels.* (1) No repairs or alterations affecting the safety of the vessel shall be made without the knowledge of the Officer in Charge, Marine Inspection.

(2) Drawings of alterations shall be approved before work is started unless deemed unnecessary by the Officer in Charge, Marine Inspection. The general scope of the plans shall be as noted in paragraph (d) of this section. Drawings will not be required for repairs in kind.

§ 111.05–10 Testing and inspection.

(a) *Application.* This section shall be applicable to all vessels, both those existing as of November 18, 1952, and those contracted for on and after November 19, 1952.

(b) (1) The general requirements for inspection of vessels are contained in Part 31 of Subchapter D (Tank Vessels), Part 71 of Subchapter H (Passenger Vessels), and Part 91 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter. The contents of this section supplement the general requirements contained in other parts of this chapter.

(2) In the inspection of electrical equipment and installations, the rules promulgated by the American Bureau of Shipping respecting materials and construction, and the certificate of classification referring thereto, except when otherwise provided for by the rules and regulations of this subchapter, shall be accepted as standard.

(i) The requirements of this paragraph shall not be construed to imply that ship tests or factory inspections of electrical apparatus or equipment of the types regularly conducted by the American Bureau of Shipping will be conducted by the Coast Guard. Shop tests of electrical apparatus or equipment will be conducted by the Coast Guard only when specifically required by the regulations in this chapter, or when specifically requested, either by the manufacturer, shipbuilder, owner, or the Coast Guard, and agreed to by all concerned.

(c) *Initial inspection*—(1) *Scope.* The initial inspection, which may consist of a series of inspections during the construction of the vessel, shall include a complete inspection of the electrical installation and electrical equipment or apparatus. The inspection shall be such as to insure that the arrangement, materials, and installations thereof, fully comply with the applicable regulations in this chapter and are in accordance with approved plans. The inspection shall also be such as to insure that the workmanship of all equipment and apparatus and the installation thereof is, in all respects, satisfactory.

(2) *Inspections required.* The specific inspections described in this paragraph are intended as suggestions to the marine inspector. It is not the intention of this paragraph to require, in the case of any particular vessel, any tests which, in the opinion of the Officer in Charge, Marine Inspection, are unnecessary.

(3) *Electric cable.* Electric cable should be checked during installation for size and type as shown on the approved plans. The adequacy of cable supports should be checked, and it should be ascertained that no cable is installed in the proximity of steam pipes or other hot objects and that the cables have not been damaged during the installation due to excessive pulling force having been applied, or due to sharp bends or sharp or rough edges of cable supports or bulkhead penetrations, etc. Cable penetrations required to be watertight should be checked for proper packing of the terminal or stuffing tubes, including provisions for future take-up of gland nuts.

(4) *Generators.* Generators should be checked for general condition, both electrical and mechanical, voltage regulation, parallel operation, operation of safety devices such as reverse current or reverse power trips, overcurrent trips, overspeed trips, low oil pressure trips, etc.

(5) *Rotating electrical machinery.* Rotating electrical machinery should be checked to assure that rotating and/or uninsulated electrical parts are adequately shielded from accidental contact by personnel.

(6) *Switchboards.* Switchboards should be checked for hand rails, guard rails, working spaces, insulating floor covering, drip covers, and enclosures for backs and ends. Switchboard mounted apparatus should be checked for identifying nameplates. Circuit nameplates should be compared with the rating or setting of the overcurrent devices and with the approved plans. The accessibility of items requiring maintenance or adjustment should be checked. Meters should be checked for proper calibration. The operation of automatic switchgear and mechanical interlocks should be observed.

(7) *Motor starters.* Motor starters should be checked to assure proper starting of the motor under service conditions. A wiring diagram of each motor starter should be secured to the inside of its enclosure door. Each motor starter not completely disconnected from all sources of potential when the disconnect switch is opened (due to electrical interlocked circuits necessary for proper operation of the apparatus or for other valid reasons) should be checked to assure that attention is directed to such conditions by a suitable sign.

(8) *Disconnect switches.* The presence and location of disconnect switches required for motor starters, fuses, etc., should be checked. When a switch or circuit breaker on a switchboard or distribution panel is intended to serve as a motor and controller disconnect switch, it shall be determined that the applicable requirements of the regulations in this subchapter have been met.

(9) *Accessibility.* The accessibility of electrical apparatus for normal inspection and maintenance should be ob-

served. The accessibility of junction boxes and the like in way of paneling should be noted during construction of a vessel. Hinged doors of motor starters and similar apparatus should be checked for interference with adjacent structural parts or apparatus.

(10) *Panelboards.* The rating or setting of the overcurrent devices should be compared with the values given on the circuit directory and with the approved plans. The accuracy of the directory description of loads served by each circuit should be checked.

(11) *Grounding.* It should be determined that metal enclosures for electrical equipment are grounded, either by the method of mounting or by ground leads. Portable equipment should be checked for grounding through the grounding conductor of the supply cable.

(12) *Emergency lighting and exit lights.* The adequacy of emergency lights and exit lights should be checked at night with all general lighting turned off.

(13) *General alarm system.* The general alarm system should be checked with a sound level meter, the sound level of the bells being measured in each stateroom for passengers or crew with doors closed. Where the background noise level is questionable, the background noise level should be measured while the vessel is underway. For the required sound levels, see § 113.25–10 (c) of this subchapter.

(14) *Emergency loudspeaker system.* The emergency loudspeaker system should be checked with a sound level meter, the sound level being measured at several locations in the vicinity of each lifeboat handling station, each lifeboat embarkation station, each passenger assembly station, and throughout crew quarters. Where the background noise level is questionable, the background noise level should be measured while the vessel is underway. For the required sound levels, see Table 113.50–15 in § 113.50–15 of this subchapter. It should be demonstrated that voice reproduction is of good quality and intelligibility is of a high order. It should be demonstrated that grounding or opening either conductor or "shorting" both conductors to a typical lifeboat station loudspeaker or to a typical embarkation deck loudspeaker, each to be selected by an inspector, will not reduce the output of any one of the remaining loudspeakers by more than three decibels.

(15) *Fire detecting systems.* Fire detecting systems should be checked for compliance with the applicable regulations in this chapter and for conformance with the approved plans. Power supply circuits and thermostat circuits should be checked for supervision.

(16) *Communication systems.* All communication systems should be checked for performance and for compliance with the regulations in this chapter.

(17) *Insulation resistance.* All electric power and lighting cable and equipment should be checked for proper insulation resistance to ground and between conductors.

(d) *Inspection for certification—(1) General.* The inspection of electrical installations at the annual or biennial inspection incident to reissuance of a certificate of inspection shall include an inspection of all items enumerated in paragraph (c) of this section to the extent necessary to determine mechanical and electrical condition of performance. Particular note should be made of circuits added or modified after the initial inspection.

(2) *Fire detecting system.* Fire detecting thermostats should be tested at regular intervals (at least 25 percent of those installed tested annually) to detect any change in operating characteristics. A portable hand light with an open end sheet metal shield (such as a No. 3 fruit can) replacing the usual guard and globe would usually serve as a source of heat to operate the thermostat without damage to paint work or to the thermostat itself. Any thermostat requiring a time to operate materially different from the average when covered with the heating device should be suspected of being defective and forwarded to Coast Guard Headquarters for further testing.

(3) *Vital machinery.* Motors, motor starters and control switches used with machinery vital to the safety or propulsion of the vessel should be examined visually and opened for closer inspection when there is evidence of deterioration.

(4) *Storage batteries.* Storage batteries used for emergency lighting, diesel-engine-driven emergency generator starting, general alarm, etc., should be checked for capacity. Storage batteries supplying emergency lighting should be required to carry the connected loads for the prescribed length of time.

(e) *Repairs or alterations.* An inspection, either general or partial, depending upon the circumstances, shall be made whenever any important repairs or alterations are undertaken.

§ 111.05–15 General considerations.

(a) *General.* (1) Electrical installations on vessels shall be such that:

(i) Services essential for safety will be maintained under various emergency conditions; and

(ii) The safety of passengers, crew, and vessel from electrical hazards will be assured.

(2) Electrical equipment should be so placed or protected as to minimize the possibility of mechanical injury or damage from the accumulation of dust, oil vapors, steam, or dripping liquids. Apparatus liable to arc should be ventilated or placed in ventilated compartments in which flammable gases, acid fumes, and oil vapors cannot accumulate. Skylights and ventilators are to be so arranged as to avoid the possibility of flooding the apparatus.

(b) *Protection from bilge water.* All generators, motors, and electric couplings are to be so arranged that they cannot be damaged by bilge water, and if necessary a watertight coaming should be provided to form a well around the base of such equipment with provisions for removing water from the well.

(c) *Accessibility.* The design and arrangement of electrical apparatus should provide accessibility to parts requiring inspection or adjustment. Armature and field coils, rotors and revolving fields should be removable, and where air ducts are used there should be means of access.

(d) *Watertight equipment.* All electrical equipment exposed to the weather or located in spaces where they would be exposed to seas, splashing, or other severe moisture condition, shall be of the watertight type or be protected by means of watertight enclosures which shall be such as to prevent the exposure of the equipment to temperatures in excess of those for which they have been designed.

(e) *Corrosion-resistant parts.* Enclosures, working and other parts of electrical equipment which would be damaged or rendered ineffective by corrosion shall be made of corrosion-resistant materials or of material rendered adequately corrosion resistant.

(f) *Grounding of permanent equipment.* (1) All exposed metal parts of electrical machines or equipment which are not intended to be "live," but are liable to become "live" under fault conditions, shall be grounded and all electrical apparatus shall be so constructed and so installed that danger of injury in ordinary handling shall not exist.

(2) Metal frames of all portable lamps, tools, and similar apparatus supplied as ship's equipment and rated 30 volts or more alternating current or 50 volts or more direct current shall be grounded through a suitable conductor in the supply cable.

(g) *Means for ground detection.* (1) Adequate means for ground detection for ships' power and lighting systems and distribution systems isolated from the ships' power and lighting systems by transformers or motor-generator sets shall be provided.

(2) If lamps are used for ground detection they shall have a rating of not more than 25 watts nor less than 5 watts operating at approximately one-half voltage in the absence of grounds.

(3) For dual-voltage, grounded-neutral, alternating current distribution systems, an ammeter shall be provided to indicate current flowing in the ground connection. The ammeter shall have a full scale range of 10 amperes. An ammeter switch of the spring return to "on" (ammeter read) type shall be provided. Where the ammeter is located remote from the ground connection and a current transformer is used, a suitable protective device shall be provided near the current transformer to prevent high voltage in the event of an open circuit. The ammeter and associated equipment shall be capable of sustaining without damage the maximum fault current available.

(h) *Limitations of porcelain use.* Porcelain should not be used for lamp sockets, switches, receptacles, fuse blocks, etc., where the material is rigidly fastened by machine screws or the equivalent.

§ 111.05–20 Temperature ratings.

(a) In the requirements of this subchapter, except as noted in paragraph (b) of this section, an ambient temperature of 40° C. has been assumed for all locations except boiler and engine rooms, while for these latter spaces 50° C. has been assumed as the ambient temperature. Where the ambient temperature is in excess of these values, the total temperature specified shall not be exceeded. Where equipment has been rated on ambient temperatures less than those contemplated, consideration will be given to the use of such equipment provided the total temperature for which the equipment is rated will not be exceeded.

(b) For the assumed ambient temperature for lighting fixtures, see § 111.60–35 (c) (2). For the assumed ambient temperature for thermal trip circuit breakers, see § 111.55–15(e) (6).

§ 111.05–25 Nature of electrical supply.

(a) *Standard systems.* The following systems of distribution are recognized as standard:

(1) Two-wire with direct current or single phase alternating current;

(2) Three-wire with direct current or single phase alternating current; and,

(3) Three-wire, three-phase alternating current.

(4) Four-wire, three-phase alternating current.

(b) *Standard voltages.* The voltages given in Table 111.05–25 (b) are recognized as standard.

TABLE 111.05–25 (b)—STANDARD VOLTAGES

Equipment	Direct current (volts)	Alternating current (volts)
Lighting	115	115.
Power	115 and 230	115, 220, and 440.
Generators	120 and 240	120, 230, and 450.
Propulsion	1,000 maximum	7,500 maximum.

(c) *Standard frequency.* A frequency of 60 cycles per second is recognized as standard for alternating-current lighting and power systems.

(d) *Others.* Special consideration will be given to systems, voltages, or frequencies differing from the recognized standard.

§ 111.05–30 Insulation materials.

(a) *Class designation.* Insulation material referred to in this subchapter is designated by class as described in this section.

(b) *Class O insulation.* Materials or combinations of materials such as cotton, silk, and paper without impregnation.[1]

(c) *Class A insulation.* Materials or combinations of materials consisting of (1) cotton, silk, paper, and similar organic materials when either impregnated[1] or immersed in a liquid dielectric; (2) molded and laminated materials with cellulose filler, phenolic resins, and sheets of cellulose acetate and other cellulose derivatives of similar properties and (3) varnishes (enamels) as applied to conductors. (ASA–C50.)

(d) *Class B insulation.* Materials or combinations of materials such as mica, asbestos, fiberglass, and similar inorganic materials in built-up form with organic binding substances. A small proportion of Class A material may be used for structural purposes only. Fiberglass or asbestos magnetic wire insulation are included in this temperature class. These may include supplementary organic materials, such as polyvinylacetal or polyamide films. (ASA–C50.)

(e) *Class C insulation.* Materials consisting entirely of mica, porcelain, glass, quartz, and similar inorganic materials. (ASA–C50.)

(f) *Class F insulation.* A Class F insulation system is one which by experience or accepted test can be shown to have suitable thermal endurance when operating at the limiting Class F temperature specified in the temperature rise standard for the machine under consideration. Typical materials used in a Class F system include mica, glass fiber, asbestos and other materials, not necessarily inorganic, with compatible bonding substances having suitable thermal stability. (NEMA Publication No. MG1.)

(g) *Class H insulation.* Materials or combinations of materials consisting of (1) mica, asbestos, fiberglass, and similar inorganic materials in built-up form with binding substance composed of silicone compounds, or materials with equivalent properties; (2) silicone compounds in rubbery or resinous forms, or materials with equivalent properties. A minute proportion of Class A material may be used only where essential for structural purposes during manufacture. (ASA–C50.)

[1] Insulation is considered to be "impregnated" when a suitable substance provides a bond between components of the structure and also a degree of filling and surface coverage sufficient to give adequate performance under the extremes of temperature, surface contamination (moisture, dirt, etc.), and mechanical stress expected in service. The impregnant must not flow or deteriorate enough at operating temperature so as to seriously affect performance in service.

Subpart 111.10—Generators

§ 111.10–1 Power requirements.

(a) *Propulsion.* The power for the main propulsion equipment may be derived from a single generator.

(b) *Ship's service.* (1) All ocean vessels using electricity for ship's service power or light shall be provided with at least 2 ship's service generating sets. The capacity of the generating sets shall be sufficient to carry the necessary sea load under normal operation with any 1 generating set in reserve.

(c) *Emergency power and lighting.* See Part 112 of this subchapter for requirements.

§ 111.10–5 Prime movers.

(a) In general, compliance of prime movers with the rules promulgated by the American Bureau of Shipping will be considered as satisfactory evidence of structural and operational efficiency of prime movers.

(b) Special consideration will be given to the structural and operational features of prime movers for small vessels or of unusual design not contemplated by the rules of the American Bureau of Shipping.

§ 111.10–10 Excitation.

(a) *General.* (1) Direct-current rotating exciters shall conform to all the applicable requirements for direct-current generators.

(b) *Propulsion.* Separately excited propulsion generators should be provided with more than one means of excitation. Exciters may be either direct connected or independent generating sets. Current may be derived from the ship's service power or lighting sets.

§ 111.10–15 Generator construction.

(a) *General.* (1) In general, compliance of generators with the rules promulgated by the American Bureau of Shipping will be considered as satisfactory evidence of the structural efficiency of generators.

(2) Special consideration will be given to the construction of generators for small vessels or of unusual design not contemplated by the rules of the American Bureau of Shipping.

(b) *Circulating currents.* Means shall be provided to prevent circulating currents from passing between the journal and the bearing, where the design and arrangement of the machine is such that damaging current may be expected.

(c) *Moisture condensation prevention.* When the weight of the generator excluding the shaft is over 1,000 pounds, it should be provided with means to prevent moisture condensation in the machine when idle. Where steam heating coils are installed for this purpose, there are to be no pipe joints inside the casings.

(d) *Terminal arrangement.* All generator terminals should be protected against accidental contact, mechanical damage, and where necessary, against dripping moisture by drip shields or dripproof enclosures. Where cables enter dripproof enclosures from the sides or top, they should be provided with terminal tubes.

(e) *Nameplates.* (1) All generators shall be fitted with nameplates of corrosion-resistant material marked with the following information:

(i) Manufacturer's type and frame designations;

(ii) Output;

(iii) Kind of rating;

(iv) Temperature rise at rated load;

(v) Design ambient temperature;

(vi) Revolutions per minute at rated load;

(vii) Voltage;

(viii) Amperes at rated load; and,

(ix) Type of windings for d. c. machines.

(2) For a. c. generators, in addition to the applicable parts listed in subparagraph (1) of this paragraph, the following information shall be set forth:

(i) Number of phases;

(ii) Frequency;

(iii) Power factor;

(iv) Exciter voltage; and,

(v) Exciting current in amperes at rating.

(f) *Temperature detectors.* Alternating-current generators of 500 kva and above, when access to coils is difficult, and all alternating-current propulsion generators, should be provided with means for obtaining the temperatures of the stationary windings. The temperature should be indicated at a convenient location, preferably the control panel.

(g) *Ventilation and protection.* (1) Propulsion and ship's service generators not enclosed ventilated shall have all openings protected with substantial wire or mesh screen to prevent personnel injury, and shall be provided with protection against dripping liquids equivalent to that of a drip-proof machine.

(2) Where the protection of the generator is not the equivalent of a protected machine as defined in § 110.15–175 (h) of this subchapter, the arrangement will require specific approval for each installation.

(3) Dampers shall be provided in ventilation air ducts except where recirculating systems are used.

(h) *Fire extinguishing.* Fire extinguishing systems suitable for fires in electrical equipment are to be fitted to propulsion generators which are enclosed or in which the air gap is not directly exposed. See Part 34 of Subchapter D (Tank Vessels), Part 76 of Subchapter H (Passenger Vessels) and Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter for details of the systems.

(i) *Insulation of windings.* Armature and field coils should be treated to resist oil and water.

(j) *Lubrication*—(1) *Ship's service generators.* In general, all generators should be located with their shafts in a fore and aft direction on the vessel and they must lubricate and operate satisfactorily when permanently inclined to an angle of 15 degrees athwartship and 5 degrees fore and aft; the bearings are to be so arranged that they will not spill oil under a momentary roll of 30 degrees. Where it is not practicable to mount the generators with armature shafts in the fore and aft direction, their lubrication will require special consideration. Generators depending on forced lubrication, unless otherwise approved, should be provided with means to shut down their prime movers automatically on failure of the lubricating system. Provision is to be made to prevent oil or oil vapor from passing into the machine windings.

(2) *Emergency generators.* For lubrication of emergency diesel-driven generator sets also see Subpart 112.50 of this subchapter.

§ 111.10–20 Voltage regulation.

(a) *Ship's service generator.* (1) Ships service generator's inherent voltage regulation characteristics shall comply in general with all the applicable requirements contained in Table 111.10–20(a)(1):

TABLE 111.10-20 (a) (1)—GENERATOR VOLTAGE REGULATION

Type of generator	Load variation	Voltage variation (maximum)
D. c. shunt or stabilized shunt wound generator	100 percent to 20 percent (decreasing). 20 percent to 100 percent (increasing).	8 percent voltage rise. 12 percent voltage drop.
D. c. compound wound generator and d. c. shunt wound generator with voltage regulator.	20 percent to 100 percent (increasing).	2½ percent.
	20 percent to 100 percent (increasing). 100 percent to 20 percent (decreasing).	3 percent from average of ascending and descending curves.
D. c. 3-wire generator (in addition to the above).	Rated current on either positive or negative and 25 percent rated current on neutral and rated voltage positive to negative.	Negative to neutral and positive to neutral 2 percent of rated positive to negative voltage.
A. c. generator and regulator (no reactive droop compensation).	0 percent to 100 percent (increasing). 100 percent to 0 percent (decreasing). (At rated power factor.)	1 percent of rated voltage from a median value halfway between highest and lowest values attained.[1]
Two or more a.-c. generators and regulators with reactive droop compensation adjusted for a voltage droop of not more than 4 percent of rated voltage for a reactive load change from 0 percent to 60 percent of continuous kilovolt-ampere rating.	0 percent to 100 percent (increasing). 100 percent to 0 percent (decreasing). (At rated power factor.)	Not more than 4 percent droop and no point more than 1 percent of rated voltage from the average curve drawn through a plot of settled voltage versus load for any increasing or decreasing load between zero and full load.

[1] May be 2½ percent for emergency generator.

(2) Generators shall, where practicable, be tested with their own driving units. When tested with temporary driving units, allowance shall be made for the expected speed regulation of the driving units to assure satisfactory voltage regulation, as given in Table 111.10–20 (a) (1) after assembly with the permanent driving units.

(3) Where automatic voltage regulators are not supplied the d. c. ship's service generators should be approximately flat compounded except that, if the load fluctuation does not interfere with the operation of vital auxiliaries, shunt wound generators without voltage regulators or stabilized shunt wound machines may be used.

(4) In general a separate regulator should be supplied for each a. c. generator. When it is intended that 2 or more generators will be operated in parallel, reactive droop compensating means should be provided to divide the reactive power properly between the generators. The regulator in conjunction with the exciter and the generator characteristics should be capable of performing in accordance with conditions set forth in this section.

§ 111.10–25 Parallel operation.

(a) In general, when the installation is such that 2 or more generators are to be operated in parallel, the load on any generator should not differ more than plus or minus 15 percent of its rated kilowatt load from its proportionate share, based on the generator ratings, of the combined load for any steady state condition in the combined load between 20 percent and 100 percent of the sum of the rated loads of all generators. The starting point for the determination of the foregoing load distribution requirements should be at 75 percent load with each generator carrying its proportionate share.

§ 111.10–30 Temperature limitations.

(a) Generators shall be designed for an ambient temperature of 50 degrees C. When tested in accordance with American Standard C50, the temperature rises shall not exceed the values given in Tables 111.10–30 (a1) and 111.10–30 (a2). Where provisions are made for insuring an ambient temperature of 40 degrees C. or less, the temperature rises may be 10 degrees C. higher than the values given in the tables.

TABLE 111.10-30 (a1)—LIMITS OF TEMPERATURE RISES FOR DIRECT-CURRENT GENERATORS BASED ON 50° C. AMBIENT TEMPERATURE[1]

Part of generator	Limits of temperature rises—degrees centigrade (measured by thermometer)[2][3]					
	Class A insulation		Class B insulation		Class H insulation	
	Continuous	At end of 2-hour overload	Continuous	At end of 2-hour overload	Continuous	At end of 2-hour overload
All insulated windings other than items next following	60	55	60	75	80	105
Single-layer field windings with exposed uninsulated surfaces and bare copper windings	50	65	70	85	100	125
Cores and mechanical parts in contact with or adjacent to insulation	60	55	60	75	80	105
Commutator and collector rings	55	65	75	85	90	115
German silver or grid shunts on series field windings	175	----------	175	----------	(4)	----------
Bearings	35	----------	40	----------	(4)	----------

[1] Special consideration shall be given to other parts of the machine such as bearings, etc.
[2] Where other methods are used refer to ASA-C-50 for temperature rise limits.
[3] For Class F insulation refer to NEMA-MG1.

TABLE 111.10-30(a2)—LIMITS OF TEMPERATURE RISES FOR ALTERNATING-CURRENT GENERATORS BASED ON 50° C. AMBIENT TEMPERATURE [1] [2]

Item	Limits of temperature rises, degrees centigrade [3]						
	Determined by—	Salient pole generators			Turbine type generators		
		Class A insulation	Class B insulation	Class H insulation	Class A insulation	Class B insulation	Class H insulation
Armature windings of machines of 1,500 kva. and less.	Thermometer	40	60	100			
Armature windings of machines of 750 kva. and less.	do				40	60	100
Armature windings with 2 coil sides per slot in stators of machines above 1,500 kva.	Imbedded detector	50	70	110			
Armature windings with 2 coil sides per slot in stators of machines above 750 kva.	do				50	70	110
Insulated field windings	Resistance	50	70	110	80	80	120
Collector rings	Thermometer	55	75	115	55	75	115
Cores and mechanical parts in contact with or adjacent to insulation.	do	40	60	100	40	60	100
Bearings	do	35	40	(2)	35	40	(2)

[1] For generators having 25 percent overload rating for 2 hours, the temperature at the end of the overload run when conducted immediately following the continuous run shall not exceed the figures in the table by more than 15° C. except for collector rings which shall be in accordance with the table.
[2] Special consideration shall be given to other parts of the machine such as bearings, etc.
[3] For Class F insulation, refer to NEMA-MG1.

§ 111.10–35 Dielectric strength of insulation.

Generators shall be capable of withstanding without damage a dielectric test in accordance with American Standard C50.

§ 111.10–40 Tests.

(a) Sufficient tests should be made by the manufacturer to insure that the machine is in accordance with these regulations.

Subpart 111.15—Storage Batteries

§ 111.15–1 General requirements.

(a) *Power and light batteries.* Power and lighting batteries may be of the lead acid or alkaline type, or any other approved type, due consideration being given to suitability for any specific application. The cells shall be constructed so as to prevent spilling of electrolyte due to an inclination of 40° from the normal.

(b) *Emergency and general alarm storage batteries.* When batteries are used for emergency lighting and power loads or for general alarm system loads, the requirements of Part 112 of this subchapter are also applicable.

(c) *Categories.* Batteries shall be classified into three types depending upon power output of the battery charger.

(1) *Large.* Large batteries shall be considered those connected to a battery charger whose output is more than 2 kw. (calculated from the maximum obtainable charging current and the normal voltage of the battery).

(2) *Moderate.* Moderate batteries shall be considered those connected to a battery charger whose output is between 0.2 kw. and 2 kw. (calculated from the maximum obtainable charging current and the normal voltage of the battery).

(3) *Small.* Small size batteries shall be considered those connected to a battery charger whose output is less than 0.2 kw. (calculated from the maximum obtainable charging current and the normal voltage of the battery).

(d) *Nameplates.* Each tray shall be provided with a durable nameplate securely attached, bearing the manufacturer's name or trade mark and type designation, the ampere-hour rating at a specific rate of discharge, and the specific gravity of the electrolyte (for a lead acid battery when fully charged). Data molded on the tray case will be acceptable in lieu of a nameplate.

§ 111.15–5 Battery installation.

(a) *Large storage batteries.* Large batteries should be installed in a room assigned to batteries only, but may be installed in a box on deck if a room is not available. Lighting equipment installed in a battery room shall be explosion proof suitable for Class I, Group D, locations. Devices liable to arc, such as switches, battery chargers, etc. shall not be installed in battery rooms. The overload protective device required by § 111.15–25 should be placed in each conductor adjacent to but outside the room. Electric cables other than those serving the battery or battery room lighting should be routed around rather than through the battery room.

(1) A "danger notice" shall be permanently secured to the doors of the battery room or to the covers of battery deck boxes indicating that a naked light or smoking in these rooms or in this vicinity is prohibited.

(b) *Batteries of moderate size.* Batteries of moderate size as described in § 111.15–1(c)(2) should preferably be installed in a battery room or in a box on deck, but may also be installed in a box or locker in some suitable space such as an engineroom, storeroom, etc., or may be installed open if protected from above from falling objects in the engineroom or in a similar well-ventilated compartment. Batteries should not be installed in sleeping spaces. Engine cranking batteries should be located as closely as possible to the engine or engines served.

(c) *Batteries of small size.* Batteries of small size as described in § 111.15–1(c)(3) may be installed in such places as open working spaces and boat engine compartments provided that the space is ventilated.

§ 111.15–6 Arrangement.

(a) *Battery trays.* Battery trays should be chocked with wood strips or equivalent to prevent movement and each tray should be fitted with nonabsorbent insulating supports on the bottom and with similar spacer blocks at the sides or with equivalent provisions to secure air circulation space all around each tray. Battery trays should be so arranged that the trays are accessible and with not less than 10 inches head room.

(b) *Tiers.* When batteries are arranged in two or more tiers, all shelves should have not less than 2 inches space front and back for circulation of air.

§ 111.15–10 Ventilation.

(a) *General.* All rooms, lockers, and boxes for storage batteries should be arranged or ventilated to avoid accumulation of flammable gas.

(b) *Battery rooms.* Natural ventilation may be employed if ducts can be run directly from the top of the room to the open air above with no part of the duct more than 45° from the vertical. These ducts should not contain appliances (e.g., flame arrestors) which may impede the free passage of air or gas mixtures. Rooms containing large battery banks as defined in § 111.15–1(c)(1) shall be ventilated by mechanical exhaust. When mechanical exhaust is required, the system shall be separate from ventilation systems for other spaces, and, if electric, the motor shall be located outside the battery room. Mechanical ventilation systems shall be interlocked with the battery charger so that the battery cannot be charged without ventilation. Adequate openings, whether connected to ducts or not, for air inlet shall be provided near the floor or the bottom of lockers or boxes. In every case the quantity of the air expelled should be at least equal to:

$$(q = 3.89in) \qquad (1)$$

where:
q = quantity of expelled air in cubic feet per hour.
i = maximum charging current during gas formation, however at least one-fourth of the maximum obtainable charging current of the charging facility.
n = number of cells.

(c) *Battery lockers.* Battery lockers should be ventilated, if practicable, similarly to battery rooms by a duct led from the top of the locker to the open air or to an exhaust ventilation duct, but the duct may terminate not less than 3 feet above the top of the locker in machinery spaces and similar well-ventilated compartments. Louvers or equivalent should be provided near the bottom for entrance of air.

(d) *Deck boxes.* Deck boxes should be provided with a duct from the top of the box terminating at least 4 feet above in a gooseneck, mushroom head, or equivalent to prevent entrance of water. Holes for air inlet should be provided on at least two opposite sides of the box.

The entire deck box, including openings for ventilation, should be weathertight to prevent entrance of spray or rain.

(e) *Boxes for small batteries.* Boxes for small batteries require no ventilation other than openings near the top to permit escape of gas.

§ 111.15–15 Protection from corrosion.

(a) Shelves in battery rooms or lockers for acid batteries should have a watertight lining of sheet lead of 1/16-inch thickness carried up not less than 3 inches on all sides. For alkaline batteries the shelves should be similarly lined with steel not less than 1/32-inch thick. Alternatively, a battery room may be fitted with a watertight lead pan for acid batteries, steel for alkaline batteries, over the entire deck, carried up not less than 6 inches on all sides. Deck boxes should be lined in accordance with the above alternative method. Boxes for small batteries should be lined to a depth of 3 inches consistent with the methods described above.

(b) Alternate lining materials may be used in lieu of lead or steel if it can be established that the material is corrosion-resistant to the specified electrolyte used in the batteries.

§ 111.15–20 Conductors.

When conductors enter battery rooms the holes shall be made watertight. All connections within battery rooms shall be resistant to the electrolyte. Cables shall be sealed to resist the entrance of electrolyte by spray or creepage. The size of the connecting cable is to be based on current carrying capacities given in Table 111.60–1(e)(1)(i) and the starting rate of charge or maximum discharge rate, whichever is the greater, shall be taken into consideration in determining the cable size.

§ 111.15–25 Overload and reverse current protection.

(a) An overload protective device shall be placed in each battery conductor, except that engine cranking batteries and batteries with a nominal potential of 6 volts or less need not be protected against overload. For location of overcurrent devices with regard to battery rooms, see § 111.15–5(a).

(b) The charging equipment (except when a rectifier is employed) for all batteries with a nominal voltage more than 20 percent of line voltage shall provide automatic protection against reversal of current.

Subpart 111.20—Transformers

§ 111.20–1 General requirements.

(a) All transformer windings should be treated to resist moisture, sea atmosphere, and oil vapors.

§ 111.20–5 Temperature rise.

(a) The temperature rise, based on an ambient temperature of 40° C., shall not exceed the following:

Class A insulation: 55° C.
Class B insulation: 80° C.
Class H insulation: 150° C.

(b) If the ambient temperature exceeds 40 degrees C. the transformer shall be derated so that the total temperature given in this section is not exceeded. Temperatures are to be taken by the resistance method of temperature determination.

Subpart 111.25—Motors

§ 111.25–1 General requirements.

(a) The requirements for generators contained in § 111.10–15 (a), (b), (c), (f), (g), (h), (i) and (j) are also applicable to motors, except that § 111.10–15 (c), (f) and (h) are applicable to propulsion motors only.

§ 111.25–5 Nameplates.

(a) All motors shall be fitted with nameplates of corrosion-resistant material. The nameplates shall be marked with the following information:

(1) Manufacturer's type and frame designation;
(2) Output (hp.);
(3) Kind of rating;
(4) Design ambient temperature;
(5) Temperature rise at rated load;
(6) Revolutions per minute at rated load;
(7) Voltage;
(8) Amperes at rated load; and,
(9) Type of winding (for d. c. machines).

(b) For alternating-current motors, in addition to the applicable parts listed in paragraph (a) of this section, the nameplates shall be marked with the following information:

(1) Number of phases;
(2) Frequency;
(3) Power factor (synchronous motors only);
(4) Exciter voltage (synchronous motors only);
(5) Exciter current (synchronous motors only);
(6) Secondary voltage (polyphase wound-rotor induction motors only);
(7) Secondary amperes at rated load (polyphase wound rotor induction motors only);
(8) For motors rated at 1/2 horsepower or larger, except a polyphase wound-rotor motor, a code letter to show its input in kilovolt-amperes with locked rotor selected from Table 111.25–5 (b)(8); and
(9) For multi-speed motors, amperes at rated load for each winding or winding connection.

TABLE 111.25–5(b)(8)—LOCKED ROTOR INDICATING CODE LETTERS

Code letter	KVA per hp. with locked rotor
A	0 – 3.14
B	3.15– 3.54
C	3.55– 3.99
D	4.0 – 4.49
E	4.5 – 4.99
F	5.0 – 5.59
G	5.6 – 6.29
H	6.3 – 7.09
J	7.1 – 7.99
K	8.0 – 8.99
L	9.0 – 9.99
M	10.0 –11.19
N	11.2 –12.49
P	12.5 –13.99
R	14.0 –15.99
S	16.0 –17.99
T	18.0 –19.99
U	20.0 –22.39
V	22.4 –and up

(c) For nonvital motors, such as winch motors, refrigeration motors, water cooler motors, galley appliance motors, etc., nameplates with standard commercial markings will be acceptable. Nameplates for motors located in corrosive locations shall be made of corrosion-resistant material.

§ 111.25–10 Temperature limitations.

(a) Motors for use in the engine room or boiler room shall be designed for an ambient temperature of 50 degrees C. Motors for use in locations where the ambient temperature will not exceed 40 degrees C may be designed for an ambient temperature of 40 degrees C. Motors, when tested in accordance with American Standard C50, shall not exceed the limits of temperature rises given in Tables 111.25–10 (a1) and (a2).

TABLE 111.25–10(a1)—LIMITS OF TEMPERATURE RISES FOR DIRECT-CURRENT MOTORS [1]

Part of motor and type of enclosure	Limits of temperature rises; degrees centigrade (thermometer method) [2] [3]					
	Class A insulation		Class B insulation		Class H insulation	
	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature
All insulated windings other than item next following:						
Open and semienclosed	50	40	70	60	110	100
Totally enclosed	55	45	75	65	115	105
Single-layer field windings with exposed uninsulated surfaces and bare copper windings:						
Open and semienclosed	60	50	80	70	130	120
Totally enclosed	65	55	85	75	135	125
Cores and mechanical parts in contact with or adjacent to insulation:						
Open and semienclosed	50	40	70	60	110	100
Totally enclosed	55	45	75	65		
Commutators and collector rings:						
All types	65	55	85	75	125	115
Bearings:						
Open and semienclosed	40	35	45	40	(1)	(1)
Totally enclosed	45	40	50	45	(1)	(1)

[1] Special consideration shall be given to other parts of the machine, such as bearings, etc.
[2] Where other methods are used refer to ASA–C–50 for temperature rise limits.
[3] For Class F insulation refer to NEMA–MG1.

TABLE 111.25-10(a2)—LIMITS OF TEMPERATURE RISES FOR ALTERNATING-CURRENT MOTORS [1] [2]

Part of motor and type of enclosure	Limits of temperature rises; degrees centigrade (thermometer method) [3] [4]					
	Class A insulation		Class B insulation		Class H insulation	
	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature
Coil windings, cores and mechanical parts in contact with, or adjacent to insulation:						
All except totally enclosed	50	40	70	60	110	100
Totally enclosed	55	45	75	65	115	105
Collector rings, commutators (the class of insulation refers to insulation affected by the heat from the commutator or collector rings, which insulation is employed in the construction of the commutator or collector rings or is adjacent thereto):						
All types	65	55	85	75	125	115
Bearings:						
Open and semienclosed	40	35	45	40	(5)	(5)
Totally enclosed	45	40	50	45	(5)	(5)

[1] Squirrel-cage windings and mechanical parts not in contact with or adjacent to insulation may reach such temperatures as will not be injurious in any respect.
[2] Special consideration shall be given to other parts of the machine, such as bearings, etc.
[3] Where other methods are used refer to ASA-C-50 for temperature rise limits.
[4] For Class F insulation refer to NEMA-MG1.

§ 111.25–15 Duty cycle.

(a) Motors shall be rated for continuous duty, except that motors for the applications listed in Table 111.25-15(a) may be short-time rated motors as indicated. Any other motors of similar duty may have consistent short-time ratings.

TABLE 111.25-15 (a)

Application of motor	Minimum short time rating of motor in hour
Deck winch and direct acting capstan.	½.
Deck winch with hydraulic transmission.	Continuous at no load, followed by ½ hour at full load.
Direct acting windlass	¼.
Windlass with hydraulic transmission.	½ hour idle pump operation followed by ¼ hour full load operation.
Steering gear, direct acting.	1.
Steering gear, indirect drive.	Continuous operation at 15 percent load followed by 1 hour at full load.
Watertight door operators.	½a.
Lifeboat winches	½a.

§ 111.25–20 Dielectric strength of insulation.

(a) Motors shall be capable of withstanding without damage a dielectric test in accordance with American Standard C50.

§ 111.25–25 Terminal arrangement.

(a) All motors shall be provided with terminal leads in terminal boxes secured to the frames. Terminal boxes shall be drip-proof or watertight, consistent with the motor enclosure. The ends of motor terminal leads shall be fitted with connectors. As an alternate to this arrangement, the frames of motors may be fitted with terminal tubes through which the cable shall pass to suitable terminals inside the frame.

§ 111.25–30 Enclosure and protection.

(a) *General.* Motors for use in the engineroom or spaces where subject to mechanical injury, or dripping of oil or water, shall be either of the waterproof or dripproof protected type, or they may be of the open type if protected in accordance with § 111.10–15(g). Care shall be exercised in locating motors high enough to avoid bilge water. Motors shall not be located beneath and covered by the floorplates unless otherwise approved by the Commandant.

(b) *Pump motors.* Motors for operating plunger and close coupled pumps should have the driving end entirely enclosed or designed to prevent leakage from entering the motor.

(c) *Motors for use on weather decks.* Motors for use on weather decks shall be of the waterproof type or shall be enclosed in waterproof housings, drained as described in § 110.15–175(k) of this subchapter.

(d) *Motors installed below decks.* Motors installed below decks should be located in as dry a place as practicable and proximity to steam, water and oil piping should be avoided.

(e) *Motors for hazardous locations.* Motors for use in hazardous locations shall comply with the requirements of § 111.60–40.

§ 111.25–35 Current ratings.

(a) For continuous duty motors, the current values given in the Table 111.25-35(a) shall be used for the purpose of determining the current-carrying capacity of conductors, switches, branch-circuit overcurrent devices, etc., in lieu of the actual current ratings marked on the motor nameplate. For multi-speed motors, for motors of unusual speeds, and for other than continuous duty motors, the nameplate current values shall be used. The motor-running overcurrent protection shall be based on the motor nameplate current rating or ratings.

TABLE 111.25-35 (a)—APPROXIMATE FULL-LOAD CURRENTS OF CONTINUOUS DUTY MOTORS [1]

Motor horsepower	Full-load current—amperes					
	D. c. motors		3-phase, a. c. induction motors			
			Squirrel-cage		Wound-rotor	
	115 volts	230 volts	220 volts	440 volts	220 volts	440 volts
⅙	2.0	1.0	0.90	0.45		
¼	2.6	1.3	1.16	.58		
⅓	3.2	1.6	1.4	.70		
½	4.5	2.3	1.9	.95		
¾	6.5	3.3	2.6	1.3		
1	8.5	4.3	3.4	1.7	5.4	2.7
1½	10.5	5.3				
1½	12.5	6.3	5.0	2.5	6.8	3.4
1¾	14.5	7.3	5.8	2.9	7.2	3.6
2	16.3	8.3	6.3	3.1	8.0	4.0
2½	20.5	10.3	7.6	3.8	8.8	4.4
3	23	12.3	9.0	4.5	10.5	5.3
4	31	16.0				
5	40	19.8	14.5	7.2	16	8.0
6	47	23.4	17.2	8.6	18	9
7½	58	28.7	21	10.5	23	11.5
9	68	34.3	24.8	12.4	26	13
10	75	38	26	13.5	29	14.5
12½	93	47	34	17	36	18
15	112	56	40	20	42	21
17½	131	65	46	23	48	24
20	150	74	52	26	54	27
22½	167	83	58	29	60	30
25	185	92	65	32	68	34
27½	202	101	70	35	72	36
30	220	110	78	39	80	40
35	257	128	92	46	94	47
40	294	146	102	51	104	52
45	329	163	116	58	116	58
50	364	180	126	63	128	64
60	432	215	152	76	154	77
75		265	188	94	188	94
100		353	250	125	250	125
125		440	310	155	310	155
150		535	370	185	370	185
200		720	490	245	490	245

[1] Table 111.25-35 (a) gives values that are approximate, and typical only of motors for usual speeds and frequencies. For low speed and special motors, the full-load currents are somewhat higher than the values shown. For this reason, the values shown should be used only for estimating purposes and the selection of cable. They should not be used in the selection of overload relay heaters and coils.

Subpart 111.30—Electric Couplings for Propulsion

§ 111.30–1 General requirements.

(a) *Enclosure and ventilation.* Electrical couplings shall be enclosed and ventilated as required for generators. All windings shall be specially treated to resist moisture, oil and salt air.

(b) *Accessibility for repairs.* The couplings should be designed to permit removal as a unit without moving the engine.

(c) *Excitation.* Excitation should be provided as for propulsion generators and motors.

(d) *Nameplates.* All electric propulsion couplings shall be fitted with nameplates of corrosion-resistant material. The nameplates shall be marked with the following information:

(1) Manufacturer's type and frame designation;

(2) Output (hp.);

(3) Kind of rating;

(4) Design ambient temperature;

(5) Temperature rise at rated load;

(6) Revolutions per minute at rated load;

(7) Voltage;

(8) Exciter voltage; and,

(9) Exciting current in amperes at rated load.

(e) *Temperature limitations.* The limits of temperature rise should be the same as for alternating-current generators, except that when a squirrel cage element is used the temperature of this element may reach such values as are not injurious. Depending upon the cooling arrangements the maximum temperature rise may occur at other than full load rating so that heat runs will require special consideration; for this purpose, when an integral fan is fitted the coupling temperatures should not exceed these limits when operated continuously at 70 percent of full load rpm., full excitation and rated torque.

Subpart 111.35—Switchboards and Propulsion Controls

§ 111.35–1 General requirements.

(a) *General.* Controlling appliances for propulsion and ship's service equipment should include the apparatus necessary for starting, stopping, reversing and controlling the speed of motors, together with essential safety devices. All wearing parts are to be readily renewable.

(b) *Switchboard installation and location.* Switchboards shall be installed in as dry a place as possible and shall be accessible from the front and rear. Switchboards shall be secured to a solid foundation, shall clear deck beams by at least 4 inches, and shall be either self-supported or braced to the bulkhead or deck above. In case the latter method is used, means of bracing shall be flexible to allow deflection of the ship's structure without buckling the control cell or assembly structure. Unless otherwise specifically approved, a clear working space of not less than 36 inches shall be provided in front of switchboards and a working space of not less than the values shown in Table 111.35–1(b) shall be provided in the rear of switchboards. In a passenger ship where there is only one main generating station, the main switchboard shall be located in the same main fire zone.

TABLE 111.35–1 (b)—WORKING SPACE IN REAR OF SWITCHBOARDS

Potential between phases or conductors of opposite polarity	Switchboard width	Clear working space in rear of switchboard in inches	
		Accessible from one end only	Accessible from both ends
250 volts or less	Single panel not exceeding 42 inches in width	[1] 24	[illegible]
	More than one panel or single panel exceeding 42 inches in width.	[1] 30	[illegible]
Over 250 volts but less than 600 volts.	Single panel not exceeding 42 inches in width	[1] 30	24
	More than one panel or single panel exceeding 42 inches in width.	[1] 36	[illegible]
600 volts or over	Any width	[1] 38	[1] 38

[1] May be reduced not more than 6 inches in way of stiffeners and frame or by equipment on a single panel in the switchboard.

(c) *Switchboard mechanical protection.* The sides of switchboards shall be enclosed and the space in the rear of switchboards made inaccessible to other than qualified persons. Non-conducting mats or gratings shall be provided on deck in the front and rear of switchboards. Non-conducting hand rails at the front and non-conducting guard rails at the rear shall be provided. Each switchboard shall have a drip-cover over the top. Hinged panels of dead front switchboards shall be provided with positioners and stops.

(d) *Switchboard construction.* Panels should be made of impregnated ebony asbestos, laminated phenolic material, or the equivalent. They may be made of metal if the live parts mounted thereon are properly insulated. The supporting framework for all panels is to be of rigid construction. No wood should be used in the construction of switchboards except that hardwood or nonconducting hand rails and guard rails shall be provided for the protection of personnel from live parts.

(e) *Dead front type switchboard.* Dead front type switchboards shall be used where the voltage between poles or to ground is above 250 volts direct current or 55 volts alternating current.

(f) *Corrosion-resistant parts.* Parts of switchboards and control assemblies liable to damage by corrosion should be made of noncorrodible-material or of material made corrosion resistant.

(g) *Mechanical strength of working parts.* All levers, handles, hand wheels, interlocks and their connecting links, shafts and bearings for the operation of switches and contactors should be of such proportions that they will not be broken or distorted by manual operation.

(h) *Nameplates.* Nameplates shall be provided for each piece of apparatus to indicate clearly its service. Nameplates for feeders and branch circuits shall include the circuit designation, description of the load served, and the rating or setting of the overcurrent protective device.

(i) *Protection of instrument circuits.* Except as otherwise provided in this paragraph, instruments, pilot lights, ground detector lights, potential transformers, and other switchboard devices shall be supplied by circuits protected by overcurrent devices.

(1) Circuits, the opening of which would create a hazard in the operation of the vessel, shall not be protected against overcurrent. Such circuits will usually include electric propulsion control circuits, voltage regulator supply circuits, and ship's service generator circuit breaker tripping control circuits.

(j) *Grounding of instruments, relays, meters, and instrument transformers.* Metal cases of instruments, relays, meters, and instrument transformers and the secondary windings of instrument transformers located on switchboards shall be grounded.

§ 111.35–5 Switchboard bus bars and wiring.

(a) *General.* Buses shall be designed on the basis of generator capacity and feeder loads. For a single generator, the generator bus shall have a capacity not less than the continuous rating of the generator plus any overload rating in excess of 30 minutes' duration. For more than one generator with all generating capacity feeding through one section of the bus, the capacity of the bus for the first generator shall be the same as for a single generator. For each subsequent generator the bus capacity shall be increased by 80 percent of the continuous rating of each added generator. The capacity of connection buses for each generator unit shall be not less than the continuous rating of the generator plus any overload rating in excess of 30 minutes' duration. All other bus bars and bus connections shall be designed for at least 75 percent of the combined full-load rated currents of all apparatus they supply, plus not less than 50 percent of the combined ratings of the spare switches or circuit breaker elements connected to the bus, except that when feeders supply one unit or any group of units in continuous operation they shall be designed for full load, and except that the capacity of feeder buses need not be greater than the generators buses that supply them.

(b) *Bus bar rating.* Bus bar sizes shall be not less than that indicated for the ampere ratings in Table 32 (Appendix) of AIEE Standard No. 45.

(c) *Arrangement of bus bars and wiring.* The arrangement of bus bars and wiring on the back of switchboards shall be such that all lugs are readily accessible. Soldering lugs, where used, should have a solder contact length at least 1½ times the diameter of the conductor and all nuts and connections should be fitted with locking devices to prevent loosening due to vibration.

(d) *Spacing.* Except at switching mechanisms, contactors, pilot lights, and similar switchboard mounted equipment, the spacings in a switchboard shall be not less than those indicated in Table 111.35–5 (d). Spacings at switchboard mechanisms, contactors, pilot lights, and similar switchboard mounted equipment shall conform to the requirements for the respective equipment as required by this subchapter.

TABLE 111.35–5 (d)—SWITCHBOARD SPACINGS

Voltage involved	Minimum spacing in inches between live parts of opposite polarity		Minimum spacing in inches through air or over surfaces between uninsulated live-metal parts and grounded dead metal
	Over surface	Through air	
125 or less	¾	½	½
126 through 250	1¼	¾	½
251 through 600	2	1	1

(e) *Switchboard wiring.* Instrument and control wiring should be of the stranded type not smaller than 4000 CM and should have flame-retarding insulation. Wiring from hinged panels should be of the extra flexible type.

§ 111.35–10 Switchboard mounted equipment.

(a) *General.* Air circuit breaker contacts shall be kept at least 12 inches from the ship's structure unless insulation barriers are installed. For live front switchboards the clearance between current-carrying parts and base channel shall not be less than 4 inches. Voltage regulator element shall be totally enclosed. Where rheostats or other devices that may operate at high temperatures are mounted on the switchboard, they shall be naturally ventilated and so isolated by barriers as to prevent excessive temperature of copper or adjacent devices. When this cannot be accomplished the rheostat or other device shall be mounted separate from the switchboard. In general, all fuses, except for instrument and control circuits, shall be mounted on or be accessible from the front of the switchboard. All wiring on the back of boards for voltmeter, pilot and ground lamps shall be protected by fuses.

(b) *Equipment.* Contactors, relays, switches, circuit breakers, etc., shall conform to the applicable requirements of such devices given in this subchapter.

(c) *Connections.* The connections between a direct-current generator and the bus bars shall be in accordance with Figures 1 to 10, inclusive, appendix, AIEE Standard No. 45. Other connections not less effective will be considered.

§ 111.35–15 Ship's service generator and distribution switchboards.

(a) *General.* Ship's service generator and distribution switchboards must provide adequate control of the generation and distribution of electric power.

(b) *Equipment for direct-current switchboards.* For direct-current switchboards, in addition to equipment required by paragraph (a) of this section, there shall be provided at least the equipment listed in this paragraph.

(1) An unfused generator switch or links which will completely disconnect the generator and its circuit breaker from the bus, except when the generator circuit breaker is of the draw-out type.

(2) For two-wire machines, an ammeter for each generator and, for three-wire machines, an ammeter for each positive and negative lead and a center zero ammeter in the ground connection at the generator switchboard. Ammeters shall be so located in the circuit as to indicate total generator current.

(3) For each two-wire generator, a voltmeter with voltmeter switch for connecting the voltmeter to indicate generator voltage and bus voltage. Where a shore connection is installed, one of these voltmeter switches shall also provide for reading shore connection voltage.

(4) For each three-wire generator, a voltmeter with voltmeter switch for connecting the voltmeter to indicate generator voltage, positive to negative, and bus voltage positive to negative, positive to neutral, and neutral to negative. Where a shore connection is installed, one of these voltmeter switches shall provide also for reading shore connection voltage, positive to negative, positive to neutral, and neutral to negative.

(5) A field rheostat for each generator.

(6) A pilot lamp for each generator connected between generator and circuit breaker.

(7) Adequate means for ground detection shall be provided on the ship's service generator and distribution switchboard for the following systems: ship's main power system, ship's main lighting system, and ship's emergency lighting system. When the ground detection means for these systems are ground lamps, a normally closed spring-return-to-normal switch shall be provided in the ground connection.

(8) A circuit breaker or fused switch for each shore power feeder installed, with a pilot light connected to the shore side thereof.

(c) *Equipment for alternating-current switchboards.* For alternating-current switchboards, in addition to the equipment required by paragraph (a) of this section, there shall be provided at least the equipment listed in this paragraph.

(1) An unfused generator switch or links which will completely disconnect the generator and its circuit breaker from the bus, except when the generator circuit breaker is of the draw-out type.

(2) An ammeter for each generator with a selector switch to read the current of each phase.

(3) A voltmeter for each generator with voltmeter switch for connecting the voltmeter to read generator voltage of each phase and bus voltage of 1 phase; where a shore connection is installed, one of these voltmeter switches shall provide also for reading voltage of each phase of the shore connection.

(4) A synchroscope and synchronizing lamps with selector switch to provide for paralleling in any combination.

(5) Control for prime mover speed for paralleling.

(6) An indicating watt-meter for each generator arranged for parallel operation.

(7) A frequency meter with selector switch to connect to any generator.

(8) A field rheostat for each generator and each exciter.

(9) A double-pole field switch with discharge clips and resistor for each generator.

NOTE. For generators with variable voltage exciters or rotary amplifier exciters, each controlled by a voltage regulator unit acting on the exciter field, the field switch, the discharge resistor and the generator field rheostat may be omitted.

(10) A pilot lamp for each generator connected between generator and circuit breaker.

(11) A voltage regulator complete with all accessories, including a voltage regulator functional cut-out switch.

(12) Adequate means for ground detection. For details see paragraph (b) (7) of this section.

(13) A circuit breaker or fused switch for each shore power feeder installed, with a pilot light connected to the shore side thereof.

§ 111.35–20 Emergency and interior communication switchboards.

Emergency and interior communication switchboards, when fitted, shall comply with the applicable provisions of Subpart 111.35 and of Part 112 of this subchapter.

§ 111.35–25 Electric propulsion control.

(a) *General.* The arrangement of bus bars and wiring on the back of propulsion control assemblies should be such that all parts, including the connections, are accessible. Adequate clearance should be provided between parts of opposite polarity and between live parts and ground to prevent arcing. All nuts and connections should be fitted with locking devices to prevent loosening due to vibration.

(b) *Prime mover control.* Where required by the system of control, means should be provided at the control assembly for controlling the prime mover speed and for mechanically tripping the throttle valve.

(c) *Protection.* The control assembly should be protected at the sides and back by a wire mesh, expanded metal grill, or other means if a bulkhead does not perform this function. The access doors to high voltage compartments should be interlocked to prevent opening unless the main generator field circuit is deenergized. A warning plate giving the maximum voltage inside the enclosure should

be provided on all doors entering the enclosure. Where steam and oil gages are mounted on the main control assembly, provision should be made so that the steam or oil will not come in contact with the energized parts in case of leakage.

(d) *Switches.* All switches are to be arranged for manual operation and so designed that they will not open under ordinary shock or vibration; contactors, however, may be operated pneumatically, by solenoids, or by other means in addition to the manual method which should be provided unless otherwise approved. Generator and motor switches should preferably be of the air-break type but for alternating-current systems, where they should be designed to open full load current at full voltage, oil break switches using non-flammable liquid may be used if provided with leakproof non-spilling tanks. Where necessary, field switches should be arranged for discharge resistors, unless discharge resistors are permanently connected across the field. For alternating-current systems, means should be provided for deenergizing the excitation circuits by the unbalance relay and ground relay.

(e) *Interlocks.* All levers for operating contactors, line switches, field switches and similar devices should be interlocked to prevent their improper operation. Interlocks should be provided with the field lever to prevent the opening of any main circuits without first reducing the field excitation to zero, except that when the generators simultaneously supply power to an auxiliary load apart from the propulsion, the field excitation need only be reduced to a low value.

(f) *Instruments and markings.* The necessary instruments to indicate existing conditions at all times are to be provided and mounted on the control panel convenient to the operating levers and switches. Instruments and other devices mounted on the switchboard are to be plainly labeled and the instruments provided with a distinguishing mark to indicate full load conditions. Metallic cases of all permanently installed instruments and the secondary windings of instrument transformers shall be permanently grounded.

(g) *Locations.* Either wheelhouse or engine room control may be used; however, when wheelhouse control is used an arrangement shall be provided whereby the propulsion equipment can also be controlled from the engine room, except when otherwise approved for small vessels for limited service. When the equipment is arranged for control from two or more stations, a selector switch shall be provided for connecting the control circuit to the delegated station controller. This selector switch shall be interlocked to prevent transfer of the control without removing power and to prevent restarting from the incoming control station until the control is first returned to the "Off" position.

(h) *Indicators.* (1) When two or more control stations are provided, indicating lights should be located at each control to show the station which is in control.

(2) When two or more control stations are provided, additional indicating lights should be located at each control station, except at the engine room control, to show whether the field circuits are energized or deenergized.

(3) A propeller shaft speed indicator should also be provided at each control station.

(i) *Multiple units.* Systems having two or more propulsion generators or two or more motors on one propeller shaft should be so arranged that any unit may be cut out of service without preventing the operation of the remaining units.

(j) *Ground detection and protection from electrical faults.* Ground detection together with means of protecting the propulsion generators and motors from electrical faults should be provided. For alternating-current systems, the grounding arrangement of the generator neutral should limit the current at full load voltage to not more than 20 amperes upon a fault to ground in the propulsion system. Phase unbalance and ground relays should be provided which will open the generator and motor field circuits upon the occurrence of a fault. For direct-current systems the ground detector may consist of a voltmeter or lights. Provision should be made for protection against severe overloads, excessive currents, and electrical faults likely to result in damage to the plant. Protective equipment should be capable of being so set as not to operate on the overloads or overcurrents experienced in a heavy seaway or when maneuvering.

(k) *Features for other services.* If the propulsion generator is used for other purposes than for propulsion, such as dredging, cargo oil pumps, and other special services, overload protection in the auxiliary circuit and means for making voltage adjustments should be provided at the control board. When propulsion alternating-current generators are used for other services for operation in port, the port excitation control should be provided with a device that should operate just below normal idling speed of the generator to automatically remove excitation.

(l) *Electric coupling control equipment.* Electric coupling control equipment should be combined with the prime mover speed and reversing control and should include a two-pole disconnect switch, short circuit protection only, ammeter for reading coupling current, discharge resistor and interlocking to prevent energizing the coupling when the prime mover control levers are in an inappropriate position.

§ 111.35–30 Tests for switchboards and propulsion controls.

(a) Switchboards and propulsion control apparatus shall be capable of meeting the test requirements of section 35, American Bureau of Shipping Rules for the Classification and Construction of Steel Vessels.

Subpart 111.40—Distribution Panelboards (Switchboard and Panelboard Types)

§ 111.40–1 General requirements.

(a) *Location.* Panelboards should be located in accessible positions and not in such spaces as bunkers, storerooms, cargo holds, compartments allotted alternately to passengers or cargo or locations exposed to the weather.

(b) *Enclosure.* The enclosure of distribution panelboards shall be as follows:

(1) *Switchboard type.* Distribution panels of the switchboard type, unless installed in machinery spaces or in compartments assigned exclusively to electric equipment and accessible only to qualified personnel, shall be completely enclosed or otherwise protected against accidental contact and unauthorized operation.

(2) *Panelboard type.* Panelboards not exposed to moisture, and particularly flush mounted panelboards in way of joiner work in passenger and crew accommodations and public spaces, may be of nonwatertight construction. Elsewhere panelboards generally shall be of drip-proof construction.

(3) *Watertight panelboards.* Where panelboards must be located where a watertight enclosure is necessary, the switches shall be externally operative.

(c) *Locking.* The cabinet or enclosing case of panelboards shall be locked closed where accessible to passengers.

(d) *Safety type.* Panelboards for the control of lighting circuits and panelboards containing voltages to ground in excess of 150 volts shall be of the safety type.

(e) *Construction.* Switchboard type panelboards shall conform to the applicable requirements of Subpart 111.35, except that units constructed to be completely serviced from the front need not be accessible from the rear. Unspecified panelboard construction details shall conform with the requirements of Underwriters' Laboratories, Inc., Standard for Panelboards.

(f) *Switching devices.* Panelboards for distribution to motors, appliances, lighting or other branch circuits, except general alarm circuits, shall be fitted with multipole switches or circuit breakers having a pole for each conductor. Overcurrent protection shall be provided for each ungrounded conductor of feeders and each conductor of branch circuits. For setting of overcurrent devices see Subpart 111.55. The rating of the disconnecting device shall be coordinated with the voltage and current requirements of the load, and in no case less than 30 amperes.

(g) *Overcurrent protection of and number of overcurrent devices on one panelboard.* Not more than 60 overcurrent devices of a lighting or appliance branch circuit panelboard shall be installed in any one cabinet. Panelboards supplying lighting and appliance branch circuits and panelboards having switching devices rated at 50 amperes or less shall have overcurrent protection not in excess of 200 amperes.

(h) *Relative arrangement of switches and fuses.* Panelboards having switches on the load side of any type of fuses shall not be installed.

(i) *Directory.* Panelboard switching units shall be numbered and the panelboard provided with a circuit directory card and card holder. After installation the directory card shall be marked for each circuit with the circuit designation, description of load served, and the rating or setting of the appropriate overcurrent protective device.

Subpart 111.45—Motor Circuits and Controllers

§ 111.45–1 Motor controllers, general requirements.

(a) *Suitability.* Each controller shall be capable of starting and stopping the motor which it controls, and for an alternating-current motor shall be capable of interrupting the stalled-rotor current of the motor.

(b) *Rating.* The controller shall have a horsepower rating, which shall not be lower than the horsepower rating of the motor, except as otherwise permitted in this paragraph.

(1) For a stationary motor rated at ⅛ horsepower or less that is normally left running and is so constructed that it cannot be damaged by overload or failure to start, such as clock motors and the like, the branch circuit overcurrent device may serve as the controller.

(2) For stationary motors rated at 2 horsepower or less, and 300 volts or less, the controller may be a general use switch having an ampere rating at least twice the full load current rating of the motor.

(3) For portable motors rated at ⅓ horsepower or less, the controller may be an attachment plug and receptacle.

(4) A branch circuit circuit breaker, rated in amperes only, may be used as a controller. When this circuit breaker is also used for overcurrent protection, it shall conform to the appropriate provisions of this part governing overcurrent protection.

(c) *Need not open all conductors.* Except when the motor controller serves also as a disconnecting means (see § 111.45–30 (l)) the controller need not open all conductors to the motor.

(d) *In grounded conductors.* One pole of the controller may be placed in a permanently grounded conductor provided the controller is so designed that the pole in the grounded conductor cannot be opened without simultaneously opening all conductors of the circuit.

(e) *Adjacent to motor and driven machinery.* Generally a controller shall be located adjacent to the motor and its driven machinery. Where it is desired to group motor controllers at a central location or where, for other reasons, it is not feasible to locate a controller adjacent to the motor and its driven machine, the following conditions shall be complied with:

(1) The motor and controller disconnecting means required by § 111.45–30 shall be capable of being locked in the open circuit position.

(2) Means shall be provided at the motor to start and stop the motor. Where the starting of a motor would be hazardous when not coordinated with other activities, such as the starting of a fuel oil service pump, the requirements of this subparagraph pertaining to the starting means at the motor need not be complied with.

(3) Means shall be provided at the motor to prevent starting the motor from a remote location. This means may be a switch in the control circuit.

(4) An alternative arrangement is specifically approved.

(f) *Number of motors served by each controller.* Each motor shall be provided with an individual controller, except that for motors of 600 volts or less, a single controller may serve a group of motors under any one of the conditions covered in this paragraph.

(1) If a number of motors drive several parts of a single machine or piece of apparatus.

(2) If a group of motors is under the protection of one over-current device as permitted in § 111.45–20 (c) (1).

(g) *Adjustable-speed motors.* Adjustable-speed motors, if controlled by means of field regulation, shall be so equipped and connected that they cannot be started under weakened field, unless the motor is designed for such starting.

(h) *Speed limitation.* Machines of the types listed in this paragraph shall be provided with speed limiting devices, unless the inherent characteristics of the machine, the system, or the load and the mechanical connection thereto are such as safely to limit the speed, or unless the machine is always under the manual control of a qualified operator.

(1) Separately excited direct-current motors.

(2) Series motors.

(3) Motor-generators and converters which can be driven at excessive speed from the direct-current end, as by reversal of current or decrease in load.

(i) *Enclosure*—(1) *General.* All controlling apparatus, except as otherwise permitted below, shall be protected by enclosing cases, either drip-proof or watertight, depending on their location. Cable entrance plates shall be provided on enclosing cases having a volume exceeding 200 cubic inches. Cable entrance plates for watertight enclosures and at the top of drip-proof enclosures shall be at least ⅛ inch thick and be fitted with gaskets. Watertight enclosures shall be provided with external feet or lugs for mounting.

(2) *Open type.* Control apparatus may be of the open type provided it is located in a compartment or enclosure assigned solely to electrical control equipment and accessible only to qualified persons. Where the compartment is used for other apparatus and the location of an open controller is such that it is subject to accidental contact, adequate guard rails or the equivalent shall be provided.

(j) *Hinged doors.* All controller hinged doors having either a height exceeding 45 inches or a width exceeding 24 inches shall be provided with door positioners and stops. Equipment mounted on a hinged door shall be constructed or shielded in such a manner that no live parts of the door mounted equipment will be exposed to accidental contact by a person with the door open and the circuit energized.

(k) *Grounding.* Controller cases, except insulating covers of snap switches, shall be grounded.

(l) *Construction.* The construction of controlling apparatus and their enclosures shall conform to the requirements of Underwriters' Laboratories, Inc. Standard for Industrial Control Equipment, except that sheet metal enclosures for installation in corrosive locations shall not be installed unless 1 of the conditions covered in this paragraph is complied with.

(1) The enclosure is fabricated of corrosion-resistant material.

(2) The enclosure is fabricated of sheet steel not less than ⅛-inch in thickness and hot dip galvanized after fabrication.

(3) The enclosure is fabricated of sheet steel not less than 3/16-inch in thickness and given a corrosion resistant finish in accordance with § 110.15–40 of this subchapter.

(m) *Wearing parts.* All wearing parts of controllers should be readily accessible for inspection and renewal.

(n) *Protection against low voltage.* Motor controllers for motors of 2 horsepower or larger shall be provided with protection against low voltage. Low-voltage release should be provided only on controllers for auxiliaries which are vital to the operation of the propelling equipment where automatic restart after a voltage failure will not be hazardous. Otherwise, low-voltage protection should be used. To permit prompt restoration of service after interruption, the starting current and short time sustained current of all low-voltage release loads shall be within the capacity of one generator.

(o) *Manually-operated controllers.* Manually-operated controllers shall be arranged for operation without opening the enclosing case. In the panel type the starting arm shall be arranged so that the motor will stop if the arm be left on a starting point. In regulating drum controllers the resistor shall be proportioned for the duty cycle.

(p) *Alternating-current manual auto-starters.* Alternating-current manual auto-starters with self-contained auto-transformers should be provided with switches of the quick-make-and-break type and the starter should be arranged so that it will be impossible to throw to the running position without having first thrown to the starting position. Switches should be preferably of the contactor or air-break type. In case oil is necessary, the starter should not leak when tilted to an angle of 15 degrees and should be constructed to prevent the liquid from splashing out due to the rolling of the vessel.

(q) *Identification of controllers.* A controller shall be marked with the maker's name or identification symbol, the voltage, the current or horsepower rating, and such other data as may be needed properly to indicate the motor which it controls. The identification data necessary to indicate the motor which the controller controls shall be on the external surface of the enclosure. A wiring diagram of the controller shall be permanently attached to the inside of the controller door.

§ 111.45–5 Motor overcurrent protection.

(a) *General.* The following provisions in this section specify overcurrent devices intended to protect the motors, the motor control apparatus, and the branch-circuit conductors against excessive heating due to motor overloads.

(b) *Continuous duty motors more than one horsepower.* Each continuous duty motor rated more than one horsepower shall be protected against overcurrent by one of the means covered in this paragraph. For multi-speed motors each separate winding or winding connection shall be considered separately.

(1) A separate overcurrent device which is responsive to motor current. This device shall be rated or set at not more than 115 percent of the motor full-load current rating. For multi-speed motors this device shall be rated or set at not more than 115 percent of the full-load current rating of each separate winding or winding connection. This value may be modified as permitted by paragraph (g) of this section.

(2) A thermal protector integral with the motor, approved for use with the motor which it protects on the basis that it will prevent dangerous overheating of the motor due to overload or failure to start. If the motor current interrupting device is separate from the motor and its control circuit is operated by a protective device integral with the motor, it shall be so arranged that the opening of the control circuit will result in interruption of current to the motor.

(3) For sealed (hermetic-type) refrigeration motors the protective device specified in subparagraph (1) or (2) of this paragraph shall be rated or set to trip at not more than 125 percent of the motor full-load line.

(c) *Continuous duty motors, one horsepower or less, manually started.* Any motor of one horsepower or less which is portable, is manually started, and is within sight from the starter location, shall be considered as protected against overcurrent by the overcurrent device protecting the conductors of the branch circuit. This branch circuit overcurrent device shall not be larger than that specified by Table 111.45–20 (b3), except that any such motor may be used at 125 volts or less on a branch circuit protected at 20 amperes. Any such motor which is out of sight from the starter location and any such motor which is not portable, shall be protected as specified in paragraph (d) of this section for automatically started motors.

(d) *Continuous duty motors, one horsepower or less, automatically started.* Each continuous duty motor rated at 1 horsepower or less which is automatically started shall be protected against overcurrent by the use of one of the means covered in this paragraph.

(1) In the same manner as provided for motors rated at more than 1 horsepower by paragraph (b) (1) or paragraph (b) (2) of this section.

(2) If part of an approved assembly which does not normally subject the motor to overloads and which is also equipped with other safety controls which protect the motor against damage due to stalled rotor current, the motor will be considered to be protected. Where such protective equipment is used, it shall be indicated on the name plate of the assembly where it will be visible after installation.

(3) If the impedance of the motor windings is sufficient to prevent overheating due to failure to start, the motor may be protected as specified in paragraph (c) of this section for manually started motors.

(e) *Wound-rotor secondaries.* The secondary circuits of wound-rotor alternating-current motors, including conductors, controllers, resistors, etc., shall be considered as protected against overcurrent by the motor-running overcurrent device.

(f) *Intermittent and similar duty.* A motor used for a condition of service which is inherently short time is considered as protected against overcurrent by the branch circuit overcurrent device, provided the overcurrent protection does not exceed that specified in Tables 111.45–20 (b1) and 111.45–20 (b2). Any motor is considered to be for continuous duty unless the nature of the apparatus which it drives is such that the motor cannot operate continuously with load under any condition or unless permitted by § 111.25–15.

(g) *Selection or setting of protective devices.* Where the values specified for motor-running overcurrent protection do not correspond to the standard sizes or rating of fuses, nonadjustable circuit breakers, thermal cutouts, thermal relays, the heating elements of thermal trip motor switches, or possible settings of adjustable circuit breakers adequate to carry the load, the next higher size, rating, or setting may be used, but not higher than 130 percent of the full-load current rating of the motor except that for sealed (hermetic-type) refrigeration motors the rating or setting of the protective device shall not be higher than 140 percent of the full-load current rating of the motor. If not shunted during the starting period of the motor (see paragraph (h) of this section), the protective device shall have sufficient time delay to permit the motor to start and accelerate its load.

(h) *Shunting during starting period.* If the motor is manually started (including starting with a magnetic starter having push-button control) the running overcurrent protection may be shunted or cut out of the circuit during the starting period of the motor, provided the device by which the overcurrent protection is shunted or cut out cannot be left in the starting position, and the motor shall be considered as protected against overcurrent during the starting period if fuses or time-delay circuit breakers, rated or set at not over 400 percent of the full-load current of the motor, are so located in the circuit as to be operative during the starting period of the motor. The motor-running overcurrent protection shall not be shunted or cut out during the starting period if the motor is automatically started.

(i) *Fuses; in which conductor.* If fuses are used for motor-running protection, a fuse shall be inserted in each ungrounded conductor, except that a fuse shall also be inserted in a grounded conductor under the circumstances set forth in footnote 1 of Table 111.45–5 (j) for circuits supplied by wye-delta or delta-wye connected transformers.

(j) *Devices other than fuses; in which conductors.* If devices other than fuses are used for motor-running protection, Table 111.45–5 (j) shall govern the minimum allowable number and location of overcurrent units, such as trip coils, relays, or thermal cutouts.

TABLE 111.45–5 (j)—MINIMUM NUMBER AND LOCATION OF MOTOR-RUNNING PROTECTIVE DEVICES

Kind of motor	Supply system	Number and location of overcurrent units, such as trip coils, relays, or thermal cut-outs
1-phase a. c. or d. c.	2-wire, 1-phase a. c. or d. c., ungrounded	1 in either conductor.
1-phase a. c. or d. c.	2-wire, 1-phase a. c. or d. c., one conductor grounded	1 in ungrounded conductor.
1-phase a. c. or d. c.	3-wire, 1-phase a. c. or d. c., grounded-neutral	1 in either ungrounded conductor.
3-phase a. c.	3-wire, 3-phase a. c. ungrounded	2 in any 2 conductors.[1]
3-phase a. c.	3-wire, 3-phase, one conductor grounded	2 in ungrounded conductors.[1]
3-phase a. c.	3-wire, 3-phase a. c., grounded-neutral	2 in any 2 conductors.[1]
3-phase a. c.	4-wire, 3-phase a. c. grounded neutral or ungrounded	2 in any 2 conductors, except the neutral.[1]

[1] In the case of distribution systems supplying wye-delta or delta-wye connected transformers (having the wye neutral point in the primary ungrounded or not connected to the circuit) three running overcurrent units shall be provided for the protection of 3-phase 3-wire motors.

(k) *Number of conductors disconnected by overcurrent devices.* Motor-running protective devices, other than fuses, thermal cutouts, or thermal protectors, shall simultaneously open a sufficient number of ungrounded conductors to interrupt current flow to the motor.

(l) *Motor controller as running protection.* A motor controller may also serve as the running overcurrent device if the number of overcurrent units complies with Table 111.45–5 (j), and if these overcurrent units are operative in both the starting and running position in

the case of a direct-current motor, and in the running position in the case of an alternating-current motor.

(m) *Thermal cutouts and relays.* Thermal cutouts, thermal relays and other devices for motor-running protection which are not capable of opening short circuits, shall be protected by fuses or circuit breakers with ratings or settings of not over 4 times the rating of the motor for which they are designed, unless approved for group installation, and marked to indicate the maximum rating or setting of the overcurrent device by which they must be protected.

(n) *Rating of protective devices.* Motor-running overcurrent devices other than fuses shall have a rating of at least 115 percent of the full load current rating of the motor.

(o) *Automatic restarting.* A motor-running protective device which can restart a motor automatically after overcurrent tripping shall not be installed.

(p) *Steering gear motors.* Main steering gear motors and motors associated with steering control systems shall not be provided with a motor-running protective device. In lieu of a motor-running overcurrent protection, the motor starter shall be fitted with a protective device responsive to motor current, motor temperature, or to both current and temperature which will operate an indicating light at the propulsion control station in case of overload which would cause overheating of the motor. This device shall follow as closely as practicable the temperature of the motor.

§ 111.45–10 Remote-control, electrical interlock, and indicator circuits.

(a) *General.* The deviations from the general requirements in this subchapter as covered by this section are intended to provide for peculiar conditions governing remote-control, electrical interlock, and indicator circuits.

(b) *Overcurrent protection.* Conductors of control, electrical interlock, and indicator circuits of motor controllers shall be considered as being properly protected against overcurrent by the branch circuit overcurrent device where the conductors are wholly within the controller enclosure. Conductors of control, electrical interlock, and indicator circuits external to the controller enclosure shall be considered as being properly protected against overcurrent under any one of the conditions listed in this paragraph.

(1) If the rating or setting of the branch-circuit overcurrent device is not more than 500 percent of the current-carrying capacity of the control, electrical interlock, or indicator circuit conductors.

(2) By overcurrent devices, in both sides of the line, having a rating or setting of not more than 500 percent of the current-carrying capacity of the control, electrical interlock, or indicator circuit conductors, except that where under operating conditions there is no appreciable difference in potential between the external conductors, overcurrent protection need only be provided at the supply of that side of the line.

(3) If the opening of the control, electrical interlock, or indicator circuit would create a hazard, no overcurrent protection shall be provided.

(4) For overcurrent protection of steering gear control and indicator light circuits see § 111.65–55(d)(2).

(c) *Accidental grounds.* It is recommended that remote control circuits be so arranged that an accidental ground will not start the motor.

(d) *Source of potential.* The potential for a control, interlock, or indicator circuit shall be derived from the load side of the motor and controller disconnect means specified by § 111.45–30, except that where the control functions are such that such circuits must be common to two or more controllers, the switching arrangements specified by paragraph (e) of this section, shall be complied with.

(e) *Switching.* In the design of control, interlock, and indicator circuits, all possible steps shall be taken to eliminate more than one source of potential in an enclosure. Where the control functions are such as to make it impracticable to energize a control, interlock, or indicator circuit from the load side of the motor and controller disconnect means specified by § 111.45–30, one of the following alternative methods of switching shall be employed:

(1) The potential of the control, interlock, or indicator circuits shall be limited to not more than 24 volts, in which case no disconnecting means need be provided.

(2) The conductors of control, interlock, or indicator circuits shall be disconnected from all sources of potential by a disconnect device independent of the motor and controller disconnect device specified by § 111.45–30. The two independent devices shall be located immediately adjacent one to the other, and a sign, warning the operator to open both devices to disconnect completely the motor and controller, shall be permanently attached to the exterior of the door of the main disconnect device.

(3) The conductors of control, interlock, or indicator circuits shall be disconnected from all sources of potential by a disconnect device actuated by the opening of the controller door, this device and its connections (including terminal blocks, when employed, for terminating the ships wiring) being such that there are no electrically uninsulated or unshielded surfaces.

§ 111.45–15 Heater circuits.

(a) Where motors, master switches and similar enclosures, except motor controllers, are fitted with electric heaters located inside the enclosures and energized from a separate circuit, the heater circuits shall be disconnected in the same manner as required for control, interlock and indicator circuits in § 111.45–10(e)(2). In the case of deck machinery, when the location of the motor, master switch, or similar enclosure is remote from the motor and controller disconnect device, a warning sign may be affixed to the unit enclosure warning the operator of the presence of two sources of potential within the unit enclosure and giving the location of the heater circuit disconnect device in lieu of the disconnect arrangement required by § 111.45–10(e)(2). Electric heaters installed within motor controllers and energized from a separate circuit shall be disconnected in the same manner as required by § 111.45–10(e).

§ 111.45–20 Motor-branch-circuit overcurrent protection.

(a) *General.* The provisions covered by this section specify overcurrent devices intended to protect the motor-branch-circuit conductors, the motor control apparatus, and the motors against overcurrent due to short-circuits or grounds. They are in addition to or amendatory of the provisions of Subpart 111.55.

(b) *Rating or setting for individual motors.* The motor-branch-circuit overcurrent device shall be capable of carrying the starting current of the motor. Overcurrent protection shall be considered as being obtained when this overcurrent device has a rating or setting not exceeding the values given in Tables 111.45–20 (b1) and 111.45–20 (b2).

(1) If the values for motor-branch-circuit protective devices given in Tables 111.45–20 (b1) and 111.45–20 (b2) do not correspond to the standard sizes of fuses or ratings of nonadjustable circuit breakers or possible settings of adjustable circuit breakers adequate to carry the load, the next higher size, rating or setting may be used.

(2) Where the overcurrent protection specified in Tables 111.45–20 (b1) and 111.45–20 (b2) is not sufficient for the starting current of the motor, it may be increased but shall, in no case exceed 400 percent of the motor full-load current.

TABLE 111.45–20(b1)—MAXIMUM RATING OR SETTING OF MOTOR BRANCH CIRCUIT PROTECTIVE DEVICES FOR MOTORS MARKED WITH A CODE LETTER INDICATING LOCKED ROTOR KVA

Type of motor [2]	Percent of full-load current [1]	
	Fuse rating (see also Table 111.45–20 (b3))	Circuit breaker setting: time-limit type
All a.c. single-phase and polyphase squirrel cage and synchronous motors with full-voltage, resistor or reactor starting:		
Code Letter A	150	150
Code Letter B to E	250	200
Code Letter F to V	300	250
All a.c. squirrel cage and synchronous motors with autotransformer starting:		
Code Letter A	150	150
Code Letter B to E	200	200
Code Letter F to V	250	200

[1] For certain exceptions to the values specified, see §§ 111.45–5(c), 111.45–20(b), and 111.45–20(g).

[2] For motors not marked with a code letter, see Table 111.45–20 (b2).

TABLE 111.45-20 (b2)—MAXIMUM RATING OR SETTING OF MOTOR-BRANCH-CIRCUIT PROTECTIVE DEVICES FOR MOTORS NOT MARKED WITH A CODE LETTER INDICATING LOCKED ROTOR KVA

Type of motor	Percent of full-load current [1] [2]		
	Fuse rating	Circuit breaker setting	
		Instantaneous type	Time limit type
Single-phase, all types	300		250
Squirrel-cage and synchronous (full-voltage, resistor and reactor starting)	300		250
Squirrel-cage and synchronous (autotransformer starting):			
Not more than 30 amperes	250		200
More than 30 amperes	200		200
High-reactance squirrel-cage:			
Not more than 30 amperes	250		200
More than 30 amperes	200		200
Wound rotor	150		150
Direct current:			
Not more than 50 horsepower	150	250	150
More than 50 horsepower	150	175	150

[1] For certain exceptions to the values specified, see §§ 111.45-5 (c), 111.45-20 (b), and 111.45-20 (g).

[2] Synchronous motors of the low-torque low-speed type (usually 450 r. p. m. or lower) such as are used to drive reciprocating compressors, pumps, etc., which start up unloaded, do not require a fuse rating or circuit breaker setting in excess of 200 percent of full-load current.

[3] For motors marked with a code letter, see Table 111.45-20 (b1).

(3) Table 111.45-20 (b3) tabulates usual values of motor-branch-circuit protection, motor-running protection, and minimum cable size for various motor full-load currents for ease of reference.

(c) *Several motors on one branch circuit.* Two or more motors may be connected to the same branch circuit under the conditions covered in this paragraph.

(1) Two or more motors each not exceeding 1 horsepower in rating and each having a full-load rated current not exceeding 6 amperes, may be used on a branch circuit protected at not more than 20 amperes at 125 volts or less, or 15 amperes at 600 volts or less. Individual running overcurrent protection is unnecessary for such motors unless required by the provisions of § 111.45-5 (c) or (d).

(2) Two or more motors of any ratings, each having individual running overcurrent protection, may be connected to one branch circuit provided all of the conditions contained in this subparagraph are complied with.

(i) Each motor-running overcurrent device must be approved for group installation.

(ii) Each motor controller must be approved for group installation.

(iii) The branch circuit must be protected by an overcurrent device having a rating or setting equal to that specified in paragraph (b) of this section for the largest motor connected to the branch circuit plus an amount equal to the sum of the full-load current ratings of all other motors connected to the circuit.

(iv) The branch circuit overcurrent protection must not be greater than that allowed by § 111.45-5 (m) for the thermal cutout or relay protecting the smallest motor of the group.

(v) The conductors of any tap supplying a single motor need not have individual branch circuit protection, provided they comply with either of the following: (*a*) No conductor to the motor shall have a current-carrying capacity less than that of the branch circuit conductors; or (*b*) no conductor to the motor shall have a current-carrying capacity less than one third that of the branch circuit conductors, with a minimum in accordance with paragraph (b) of this section, the conductors to the motor running protective device being not more than 25 feet long and being protected from mechanical injury.

(d) *Combined overcurrent protection.* Motor-branch-circuit overcurrent protection and motor-running overcurrent protection may be combined in a single overcurrent device if the rating or setting of the device provides the running overcurrent protection specified in § 111.45-5 (b), (c), and (d).

(e) *Overcurrent devices; in which conductor.* Overcurrent devices shall comply with the provisions of Subpart 111.55.

(f) *Rating of circuit breakers.* Circuit breakers for motor-branch-circuit protection shall have a continuous current rating of not less than 115 percent of the full-load current rating of the motors.

(g) *Selection or setting of protective devices.* If the values for branch circuit protective devices required by this section do not correspond to the standard sizes or ratings of fuses, nonadjustable circuit breakers, or thermal devices, or possible settings of adjustable circuit breakers, adequate to carry the load, the next higher size, rating, or setting may be used.

(h) *Steering gear motor branch circuits*—(1) *General.* In lieu of the requirements of paragraphs (a) to (f), inclusive, of this section, each steering gear branch circuit shall be protected only by a circuit breaker with instantaneous trip located on the switchboard from which it emanates.

(2) *Direct-current motors.* For direct-current steering gear motors, each circuit breaker shall be of the instantaneous trip type only, set to trip at a current of not less than 300 percent and not greater than 375 percent of the rated full-load current of one steering gear main motor.

(3) *Alternating-current motors.* For alternating-current steering gear motors, each circuit breaker shall be of the instantaneous trip type only, set to trip at a current of approximately 175 percent of the locked rotor current of one steering gear main motor.

(4) *Use of fuses.* On vessels of a size that may be steered by hand, fused switches may be substituted for the instantaneous trip circuit breakers required by this paragraph: *Provided,* That the arrangement of the steering gear is such that it is possible to shift to hand steering without delay: *And provided further,* That the opening of a steering gear branch circuit fuse is indicated in the wheelhouse.

(5) *General considerations.* The requirements of this paragraph contemplate the following conditions:

(i) When two steering gear main motors are provided, one is a standby which normally runs only when started preparatory to change-over, and then without load.

(ii) Auxiliary motors (servo, replenishing and filling pumps, etc.), if and as required, have an aggregate rating of not more than 10 percent of the main steering gear motor rating.

§ 111.45-25 Motor feeder overcurrent protection.

(a) *General.* The following provisions contained in this section specify overcurrent devices intended to protect feeder conductors supplying motors against overcurrents due to short-circuits or grounds.

(b) *Rating or setting, motor loads.* (1) A feeder which supplies motors shall be provided with overcurrent protection which shall not be greater than the largest rating or setting of the branch circuit protective device, for any motor of the group (based on Tables 111.45-20 (b1), 111.45-20 (b2) and 111.45-20 (b3)) plus the sum of the full load currents of the other motors of the group.

(2) If two or more motors of equal horsepower rating are the largest in the group, one of these motors should be considered as the largest for the above calculation.

(3) If two or more motors of a group must be started simultaneously, it may be necessary to install larger feeder conductors and correspondingly larger ratings or settings of feeder overcurrent protective devices.

(4) Where larger capacity feeders are installed to provide for future additions or changes, the feeder overcurrent protection may be based on the rated current-carrying capacity of the feeder conductors.

§ 111.45-30 Disconnecting means.

(a) *General.* The provisions contained in this section are intended to require disconnecting means for motors and controllers capable of disconnecting them from the circuit.

(b) *Type.* The disconnecting means shall be an enclosed, externally operable, motor-circuit switch, rated in horsepower, or a circuit breaker, except as permitted in the paragraphs (c), (d), (e), (f), and (g) of this section. Every switch in the motor branch circuit within sight from the controller location shall comply with these requirements.

(c) *One-eighth horsepower or less.* For stationary motors of ⅛ horsepower or less, the branch-circuit overcurrent device may serve as the disconnecting means.

(d) *Two horsepower or less.* For stationary motors rated at 2 horsepower or less and 300 volts or less, the disconnecting means may be a general-use switch having an ampere rating at least twice the full-load current rating of the motor.

(e) *Over two horsepower to and including 50 horsepower.* The separate disconnecting means required for a motor with an autotransformer type of controller may be a general-use switch if all of the provisions contained in this paragraph are complied with.

TABLE 111.45-20(b3)—CONDUCTOR SIZE AND OVERCURRENT PROTECTION FOR MOTORS

Full load current rating of motor in amperes	Minimum size conductor AWG and MCM									For running protection of motors (amperes) [1]		Maximum allowable rating or setting of branch circuit protective devices (amperes) [2]							
	1-conductor			2-conductor			3-conductor					With code letters F to V, inclusive, or without code letters: Single-phase and squirrel cage and synchronous, full voltage, resistor and reactor starting		With code letters B to E, inclusive: Single-phase and squirrel cage and synchronous, full voltage resistor or reactor starting. With code letters F to V, inclusive: Autotransformer starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage.[3] (Both not more than 30 amperes)		With code letters B to E, inclusive: Squirrel cage and synchronous, autotransformer, starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage.[3] (Both more than 30 amperes)		With code letter A: All motors, Without code letters: Direct-current and wound rotor motors	
	R	VC	AVC	R	VC	AVC	R	VC	AVC	Maximum rating of nonadjustable protective devices	Maximum setting of adjustable protective devices	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)
[4] 1	14	12	14	14	12	14	14	12	14	[5] 2	[5] 1.15	15	15	15	15	15	15	15	15
[4] 2	14	12	14	14	12	14	14	12	14	[5] 3	[5] 2.3	15	15	15	15	15	15	15	15
[4] 3	14	12	14	14	12	14	14	12	14	[5] 4	[5] 3.45	15	15	15	15	15	15	15	15
[4] 4	14	12	14	14	12	14	14	12	14	[5] 6	[5] 4.6	15	15	15	15	15	15	15	15
[4] 5	14	12	14	14	12	14	14	12	14	[5] 6	[5] 5.75	15	15	15	15	15	15	15	15
6	14	12	14	14	12	14	14	12	14	[5] 8	[5] 6.9	20	15	15	15	15	15	15	15
7	14	12	14	14	12	14	14	12	14	[5] 10	[5] 8.05	25	20	20	15	15	15	15	15
8	14	12	14	14	12	14	14	12	14	[5] 10	[5] 9.2	25	20	20	20	20	20	15	15
9	14	12	14	14	12	14	14	12	14	[5] 12	[5] 10.35	30	30	25	20	20	20	15	15
10	14	12	14	14	12	14	14	12	14	[5] 12	[5] 11.5	30	30	25	30	30	20	15	15
11	14	12	14	14	12	14	14	12	14	[5] 15	[5] 12.65	35	30	30	30	25	30	20	20
12	14	12	14	14	12	14	14	12	14	15	13.8	40	30	30	30	30	30	20	20
13	13	13	14	13	12	14	14	12	14	15	14.95	40	40	35	35	30	30	20	20
14	12	13	14	12	12	14	12	12	12	20	16.1	45	40	35	40	30	30	25	30
15	12	12	14	12	12	14	12	12	12	20	17.25	45	40	40	30	30	30	25	30
16	12	12	14	12	12	12	12	12	12	20	18.4	50	40	40	40	35	40	25	30
17	12	12	12	12	12	12	10	12	12	20	19.55	60	50	45	40	35	40	30	30
18	12	12	12	10	12	12	10	12	12	25	20.7	60	60	45	40	40	40	30	30
19	12	12	12	10	12	12	10	10	12	25	21.8	60	60	50	40	40	40	30	30
20	10	12	12	10	12	12	10	10	12	25	23.0	60	50	50	40	40	40	30	30
22	10	12	12	10	10	12	10	10	10	30	25.3	70	70	60	50	45	50	35	40
24	10	12	12	10	10	12	8	10	10	30	27.6	80	70	60	50	50	50	40	40
26	10	10	12	8	10	10	8	10	10	30	29.9	80	70	70	70	60	70	40	40
28	8	10	12	8	10	10	8	8	10	35	32.2	90	70	70	70	60	70	45	50
30	8	10	10	8	10	10	8	8	10	35	34.5	90	100	80	70	60	70	45	50
32	8	10	10	8	10	10	7	8	8	40	36.8	100	100	80	70	70	70	50	50
34	8	10	10	7	8	10	7	8	8	40	39.1	110	100	90	70	70	70	60	70
36	8	10	10	7	8	10	6	8	8	45	41.4	110	100	90	100	80	100	60	70
38	7	10	10	7	8	8	6	7	8	45	43.7	125	100	100	100	80	100	60	70
40	7	8	10	6	8	8	5	7	8	50	46.0	125	100	100	100	80	100	60	70
42	7	8	10	6	8	8	5	6	7	60	48.3	125	125	110	100	90	100	70	70
44	6	8	8	6	8	8	5	6	7	60	50.6	125	125	110	100	90	100	70	70
46	6	8	8	5	7	8	4	6	6	60	52.9	150	125	125	100	100	100	70	70
48	6	8	8	5	7	8	4	6	6	60	55.2	150	125	125	100	100	100	80	100
50	6	8	8	5	7	7	4	6	6	60	57.5	150	175	125	100	100	100	80	100
52	5	8	8	4	6	7	4	5	6	60	59.8	175	150	150	125	110	125	80	100
54	5	7	8	4	6	7	3	5	6	70	62.1	175	150	150	125	110	125	90	100
56	5	7	8	4	6	7	3	5	6	70	64.4	175	150	150	125	125	125	90	100
58	4	7	8	4	6	6	3	4	6	70	66.7	175	150	150	125	125	125	90	100
60	4	6	7	3	5	6	3	4	6	70	69.0	200	150	150	125	125	125	90	100
62	4	6	7	3	5	6	2	4	5	80	71.3	200	175	175	125	125	125	100	100
64	4	6	7	3	5	6	2	4	4	80	73.6	200	175	175	150	150	150	100	100
66	4	6	6	3	5	5	2	3	4	80	75.9	200	175	175	150	150	150	100	100
68	4	6	6	3	5	5	2	3	4	80	78.2	225	175	175	150	150	150	110	125
70	3	5	6	2	4	5	1	3	4	90	80.5	225	175	175	150	150	150	110	125
72	3	5	6	2	4	5	1	3	3	90	82.8	225	200	200	150	150	150	110	125
74	3	5	6	2	4	5	1	2	3	90	85.1	225	200	200	150	150	150	125	125
76	3	5	6	2	4	5	1	2	3	90	87.4	250	200	200	175	175	175	125	125
78	3	5	5	1	3	4	1	2	3	90	89.7	250	200	200	175	175	175	125	125
80	2	4	5	1	3	4	0	2	3	100	92.0	250	200	200	175	175	175	125	125
82	2	4	5	1	3	4	0	2	2	100	94.3	250	225	225	175	175	175	125	125
84	2	4	5	1	3	4	0	2	2	100	96.6	250	225	225	175	175	175	150	150
86	2	4	5	1	3	4	0	1	2	100	98.9	300	225	225	175	175	175	150	150
88	2	4	5	1	3	3	0	1	2	110	101.2	300	225	225	200	200	200	150	150
90	2	4	4	0	2	3	0	1	2	110	103.5	300	225	225	200	200	200	150	150
92	2	3	4	0	2	3	00	1	2	110	105.8	300	250	250	200	200	200	150	150
94	1	3	4	0	2	3	00	1	2	110	108.1	300	250	250	200	200	200	150	150
96	1	3	4	0	2	3	00	1	1	125	110.4	300	250	250	200	200	200	150	150
98	1	3	4	0	2	3	00	1	1	125	112.7	300	250	250	200	200	200	150	150
100	1	3	4	0	2	2	00	0	1	125	115	300	250	250	200	200	200	150	150

See footnotes at end of table.

TABLE 111.45-20(b3)—CONDUCTOR SIZE AND OVERCURRENT PROTECTION FOR MOTORS—Continued

Full load current rating of motor in amperes	Minimum size conductor AWG and MCM									For running protection of motors (amperes) [1]		Maximum allowable rating or setting of branch circuit protective devices (amperes) [2]							
	1-conductor			2-conductor			3-conductor					With code letters F to V, inclusive, or without code letters: Single-phase and squirrel cage and synchronous, full voltage, resistor and reactor starting		With code letters B to E, inclusive: Single-phase and squirrel cage and synchronous, full voltage resistor or reactor starting. With code letters F to V, inclusive: Auto-transformer starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage.[3] (Both not more than 30 amperes)		With code letters B to E, inclusive: Squirrel cage and synchronous, auto-transformer, starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage.[3] (Both more than 30 amperes)		With code letter A: All motors, Without code letters: Direct-current and wound rotor motors	
	R	VC	AVC	R	VC	AVC	R	VC	AVC	Maximum rating of nonadjustable protective devices	Maximum setting of adjustable protective devices	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)
105	1	3	3	00	1	2	000	0	1	125	120.75	350	300	300	225	225	225	175	175
110	0	2	3	00	1	2	000	0	0	150	126.5	350	300	300	225	225	225	175	175
115	0	2	3	00	1	1	000	00	0	150	132.25	350	300	300	250	250	250	175	175
120	0	2	2	000	0	1	4/0	00	0	150	138	400	300	300	250	250	250	200	200
125	00	1	2	000	0	1	4/0	00	0	150	143.75	400	350	350	250	250	250	200	200
130	00	1	2	000	0	1	4/0	00	00	150	149.5	400	350	350	300	300	300	200	200
135	00	1	2	4/0	0	0	4/0	000	00	175	155.25	450	350	350	300	300	300	225	225
140	00	1	1	4/0	00	0	250	000	00	175	161	450	350	350	300	300	300	225	225
145	000	0	1	4/0	00	0	250	000	00	175	166.75	450	400	400	300	300	300	225	225
150	000	0	1	4/0	00	0	300	000	000	175	172.5	450	400	400	300	300	300	225	225
155	000	0	1	4/0	00	00	300	4/0	000	200	178.25	500	400	400	350	350	350	250	250
160	000	0	0	250	000	00	300	4/0	000	200	184	500	400	400	350	350	350	250	250
165	000	0	0	250	000	00	300	4/0	000	200	189.75	500	400	400	350	350	350	250	250
170	4/0	00	0	250	000	00	350	4/0	4/0	200	195.5	500	500	400	350	350	350	300	300
175	4/0	00	0	300	000	000	350	250	4/0	225	201.25	600	500	450	350	350	350	300	300
180	4/0	00	0	300	4/0	000	350	250	4/0	225	207	600	500	450	400	400	400	300	300
185	4/0	00	00	300	4/0	000	350	250	4/0	225	212.75	600	500	500	400	400	400	300	300
190	4/0	00	00	300	4/0	000	400	250	4/0	225	218.5	600	600	500	400	400	400	300	300
195	250	000	00	350	4/0	000	400	300	250	225	224.25	600	600	500	400	400	400	300	300
200	250	000	00	350	4/0	4/0	450	300	250	250	230	600	600	500	400	400	400	300	300
210	250	000	00	350	250	4/0	450	300	250	250	241.5	----------	600	600	500	450	500	350	350
220	300	4/0	000	400	250	4/0	500	350	300	300	253	----------	600	600	500	450	500	350	350
230	300	4/0	000	450	300	250	550	350	300	300	264.5	----------	600	600	500	500	500	350	350
240	300	4/0	000	450	300	250	550	400	350	300	276	----------	600	600	500	500	500	400	400
250	350	250	4/0	500	300	250	600	400	350	300	287.5	----------	----------	----------	500	500	500	400	400
260	350	250	4/0	500	350	300	600	450	350	300	299	----------	----------	----------	600	600	600	400	400
270	350	250	4/0	550	350	300	650	450	400	350	310.5	----------	----------	----------	600	600	600	450	500
280	400	250	250	600	350	300	------	500	400	350	322	----------	----------	----------	600	600	600	450	500
290	400	300	250	600	400	350	------	500	450	350	333.5	----------	----------	----------	600	600	600	450	500
300	450	300	250	650	400	350	------	550	450	350	345	----------	----------	----------	600	600	600	450	500
320	500	350	300	------	450	400	------	600	500	400	368	----------	----------	----------	----------	----------	----------	500	500
340	550	350	300	------	500	450	------	600	550	400	391	----------	----------	----------	----------	----------	----------	600	600
360	600	400	350	------	550	450	------	------	600	450	414	----------	----------	----------	----------	----------	----------	600	600
380	650	450	350	------	600	500	------	------	650	450	437	----------	----------	----------	----------	----------	----------	600	600
400	700	450	400	------	650	550	------	------	------	500	460	----------	----------	----------	----------	----------	----------	600	600
420	750	500	450	------	------	600	------	------	------	500	483	----------	----------	----------	----------	----------	----------	----------	----------
440	800	550	450	------	------	650	------	------	------	600	506	----------	----------	----------	----------	----------	----------	----------	----------
460	850	600	500	------	------	------	------	------	------	600	529	----------	----------	----------	----------	----------	----------	----------	----------
480	950	650	550	------	------	------	------	------	------	600	552	----------	----------	----------	----------	----------	----------	----------	----------
500	1,000	650	550	------	------	------	------	------	------	600	575	----------	----------	----------	----------	----------	----------	----------	----------

[1] Values may be modified as permitted by § 111.45-5.
[2] Values may be modified as permitted by § 111.45-20.
[3] High-reactance squirrel cage motors are those designed to limit the starting current by means of deep-slot secondaries or double-wound secondaries and are generally started on full voltage.
[4] For the grouping of small motors under the protection of a single set of fuses, see § 111.45-20 (c).
[5] For running protection of motors of 1 horsepower or less, see § 111.45-5 (c).

(1) The motor drives a generator which is provided with overcurrent protection.

(2) The controller is:

(i) Capable of interrupting the stalled rotor current of the motor,

(ii) Provided with a no-voltage release, and

(iii) Provided with running overcurrent protection not exceeding 115 percent of the motor full-load current rating.

(3) Separate fuses or a circuit breaker, rated or set at not more than 150 percent of the motor full-load current are provided in the motor branch circuit.

(f) *Exceeding 50 horsepower.* For stationary motors rated at more than 50 horsepower, the disconnecting means may be a motor-circuit switch also rated in amperes, a general-use switch, or an isolating switch. Isolating and general-use switches for motors exceeding 50 horsepower, not capable of interrupting stalled-rotor currents, shall be plainly marked "Do not open under load."

(g) *Portable motors.* For portable motors an attachment plug and receptacle may serve as the disconnecting means.

(h) *Current-carrying capacity.* The disconnecting means shall have a current-carrying capacity of at least 115 percent of the current rating of the motor.

(i) *Poles; in which conductors.* The disconnecting means shall simultaneously open all conductors.

(j) *To be indicating.* The disconnecting means shall plainly indicate whether it is in the open or closed position.

(k) *To disconnect both motor and controller.* The disconnecting means shall disconnect both the motor and the controller from all supply conductors. The disconnecting means may be in the same enclosure with the controller.

(l) *Switch or circuit breaker as both controller and disconnecting means.* A switch or circuit breaker complying with the provisions of § 111.45–1 (b) may serve as both controller and disconnecting means if it opens all conductors to the motor, is protected by an overcurrent device (which may be the branch circuit fuses) which opens all ungrounded conductors to the switch or circuit breaker, and is one of the types listed in this paragraph.

(1) An air-break switch, operable directly by applying the hand to a lever or handle.

(2) A circuit breaker switch operable directly by applying the hand to a lever or handle.

(3) An oil switch used on a circuit whose rating does not exceed 600 volts or 100 amperes, or on a circuit exceeding this capacity if under expert supervision and by special approval.

(4) The oil switch or circuit breaker specified above may be both power and manually operable. If power operable, provisions shall be made to lock it in the open position. The overcurrent device protecting the controller may be part of the controller assembly or may be separate. A compensator type controller is not included above and will require a separate disconnecting means.

(m) *Panelboard or switchboard devices, as disconnecting means.* A branch circuit switch or circuit breaker may serve as the disconnecting means provided it conforms to all the requirements of this section. When provision for locking in the open circuit position is required by paragraph (n) of this section, accessibility for manual operation of any other switch or circuit breaker on the panelboard or switchboard shall not be interfered with.

(n) *In sight from controller location.* The disconnecting means shall be located within sight of controller location or be arranged to be locked in the open circuit position. A distance of more than 50 feet is considered equivalent to being out of sight. The disconnecting means shall be located in the same ship's compartment with the controller.

(o) *Motors served by a single disconnecting means.* Each motor shall be provided with individual disconnecting means, except that for motors of 600 volts or less a single disconnecting means may serve a group of motors under any one of the conditions covered in this paragraph. The disconnecting means serving a group of motors shall have a rating not less than is required by paragraph (b) of this section for a single motor whose rating equals the sum of the horsepowers or currents of all motors of the group.

(1) If a number of motors drive several parts of a single machine or piece of apparatus such as metal and woodworking machines, cranes, and hoists.

(2) If a group of motors is under the protection of one set of overcurrent devices as permitted by § 111.45–20 (c).

(p) *Readily accessible.* The disconnecting means shall be readily accessible.

§ 111.45–35 Special requirements for over 600 volts.

(a) *General.* The following provisions contained in this section recognize the additional hazard due to the use of high voltage. They are in addition to or amendatory of the other provisions of this subpart.

(b) *Motor overcurrent protection.* Running overcurrent protection for a motor of over 600 volts shall consist of a circuit breaker, or of overcurrent units integral with the controller which shall simultaneously open all ungrounded conductors to the motor. The overcurrent device shall have a setting as specified in § 111.45–5.

(c) *Circuit overcurrent protection.* Each motor branch circuit and feeder of more than 600 volts shall be protected against overcurrent by means of a circuit breaker of suitable rating so arranged that it can be serviced without hazard.

§ 111.45–40 Group control panels.

(a) *General.* The provisions in this section are in addition to and amendatory of the other provisions of this subpart and are applicable to two or more motor controllers grouped into a motor control center and supplied by a common feeder. The provisions of this paragraph are not applicable to the controllers for two or more motors driving several parts of a single machine or piece of apparatus when the controllers are grouped or installed in a single enclosure.

(b) *Arrangement.* Each controller and its associated motor overcurrent protective device, motor-branch-circuit overcurrent protective device and disconnecting means shall be mounted in a common metal enclosure provided with a hinged door.

(c) *Door interlock.* The hinged door required above shall be interlocked with the disconnect device to prevent the door being opened with the circuit energized.

(d) *Working space.* Working space, generally not less than 30 inches and at no point less than 24 inches, shall be provided in front of group control boards. Where access to the rear is required for making connections and for subsequent inspections, or for other purposes, space adequate for the work to be done, and in no case less than 18 inches, shall be provided.

(e) *Nameplates.* Circuit nameplates in accordance with § 111.35–1 (h) shall be provided.

(f) *Motor and motor branch circuit overcurrent protection.* In lieu of the requirements of § 111.45–5(m) and § 111.45–20(b), a motor branch circuit of group control panels may be considered to be protected against overcurrent by an instantaneous trip circuit breaker set to trip at a value not exceeding 1500 percent of the motor full-load current, provided that all the conditions of this paragraph are fulfilled.

(1) The thermal cutout, thermal relay, or other device for motor-running protection shall be capable of operation without damage to itself from a current up to the setting of the branch circuit circuit breaker.

(2) The motor controller shall be capable of opening the circuit without damage to itself resulting from a current up to the setting of the branch circuit circuit breaker.

Subpart 111.50—Distribution and Circuit Loads

§ 111.50–1 Distribution, general requirements.

(a) *General.* The ship's structure shall not be used as a normal current-carrying conductor for a ship's power, heating or lighting system, except when approved for special purposes. Such hull return shall not be used on tankers. Current-carrying parts are to be substantially protected against accidental contact. For current-carrying capacities of conductors, see Tables 111.60–1 (e)(1)(i) and 111.60–1(e)(1)(ii).

(b) *Circuits derived from auto-transformers.* Branch circuits shall not be supplied through auto-transformers (transformers in which a part of the winding is common to both primary and secondary circuits).

(c) *Polarity identification of conductors.* (1) On systems having a grounded conductor, the grounded conductor shall be identified throughout the vessel by means of a white or natural gray conductor outer covering, and any conductor so identified shall not be used as an ungrounded conductor of a circuit unless the conductor is rendered permanently unidentified by painting or other effective means at each outlet. On ungrounded systems, it is recommended that conductor identification be consistent throughout the vessel.

(2) An insulated conductor of a portable cable intended to be used as a grounding conductor shall have a continuous identifying marker readily distinguishing it from the other conductors. The identifying marker shall consist of either a braid finished to show a green color or a green colored insulation. The requirements of this subparagraph shall be effective on vessels contracted for on or after November 19, 1956.

(d) *Connections to screw-shell lampholders.* On branch circuits with a grounded conductor, the screw shell of lampholders shall be connected to the grounded neutral.

(e) *Through feed arrangements.* Where a feeder supplies more than one distribution panel or panelboard, it may be continuous from the switchboard to the farthest panel or it may be severed at any intermediate panel. If the bus bars of any distribution panel or panelboard carry "through" load, the size of the buses should be designed for the

total current. The size of feeder conductors should normally be uniform for the total length but may be reduced at any intermediate distribution panel or panelboard provided that the smallest section of the feeder is protected by the overcurrent device at the distribution switchboard.

(f) *Circuits in vicinity of magnetic compass.* Precautions should be taken in connection with apparatus and wiring in the vicinity of the magnetic compass to prevent disturbance of the needle from external magnetic fields.

§ 111.50–5 Ship's service power circuits.

(a) *Segregation of vital circuits.* Power feeders supplying apparatus required for handling the vessel are not to be used for supplying apparatus which is to be disconnected when the vessel is underway unless the branch circuits for the latter are so arranged that they may be disconnected at panelboards without interfering with the operation or protection of those circuits necessary for the safe operation of the vessel. In general, separate feeders should be run for such groups as engine room and fire room auxiliaries, motors for cargo handling gear, radio transmitters, arc searchlights and ventilation sets.

(b) *Passenger vessels.* On passenger vessels constructed with fire screen bulkheads forming fire zones, distribution systems shall be so arranged that fire in any main fire zone will not interfere with essential services in any other main fire zone. This requirement will be met if main and emergency feeders passing through any zone are separated both vertically and horizontally as widely as is practicable.

(c) *Ventilation systems.* Cargo ventilation fans, machinery spaces ventilation fans, and accommodation ventilation fans shall, if practicable, be supplied by separate feeders. All electrical ventilation systems shall be provided with remote control means for stopping the motors in case of fire or other emergency. For the machinery space ventilation, there shall be provided a control located in the passageway leading to, but outside of, the space. For all other ventilation systems there shall be provided two emergency stop stations. One of these stations shall be in the wheelhouse, fire control room, the inside passageway near the wheelhouse door, or in an accessible position in the passageway leading to, but outside of, the space ventilated. The second emergency stop station shall be located as distant as practicable from the other, except that the ventilation circuit breakers at the main ship's service switchboard may be considered as the second station provided all are grouped together and are conspicuously marked "In Case of Fire Trip To Stop Ventilation." The means provided for stopping ventilation fans from the main ship's service switchboard shall not interfere with power to other circuits. The remote emergency stop stations shall be protected by enclosures with glass paneled doors on the front of which shall be marked "In Case of Fire Break Glass and Operate Switch to Stop Ventilation." Each control switch shall have the "stop" position clearly identified and shall be provided with a nameplate identifying the system with which it is associated. This remote control system shall be of the undervoltage protection type and so arranged that damage to the master switch or cable will automatically stop the fans. For automatic shutdown of mechanical ventilation in spaces protected by a carbon dioxide fire extinguishing system, see Part 34 of Subchapter D (Tank Vessels), Part 76 of Subchapter H (Passenger Vessels), and Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(1) The requirements of this paragraph shall not be construed to include a closed ventilation system for a motor or generator, diffuser fans for refrigerated spaces, room circulating fans, or exhaust fans for private toilets of an electrical rating comparable to that of room circulating fans.

(d) *Steering gear circuits.* Electric and electro-hydraulic steering gear shall be served by two circuits from the ship's service switchboard except in special cases where the length of circuit is very short. One of the circuits may be taken from the emergency switchboard if the rating of the emergency generator is sufficient to supply the steering gear in addition to the emergency loads. The circuits shall be separated throughout their length as widely as practicable. Each circuit shall have adequate current-carrying capacity for supplying all motors and control equipment normally connected to it and which operate simultaneously.

(e) *Fuel oil service pump branch circuits.* For remote shut-down requirements for fuel oil service systems, see Part 55 of Subchapter F (Marine Engineering) of this chapter.

(f) *Tank vessels.* For special requirements for tank vessels see Subpart 111.70 of this part.

§ 111.50–10 Lighting feeders.

(a) *Passenger quarters, crew quarters, and public spaces.* On passenger vessels constructed with fire screen bulkheads forming fire zones, the lighting distribution system shall be so arranged that fire in any main fire zone will not interfere with the lighting in any other main fire zone. This requirement will be met if main and emergency feeders passing through any zone are separated both vertically and horizontally as widely as is practicable.

(b) *Machinery spaces.* Lighting for engine rooms, for the boiler rooms, and for the auxiliary machinery spaces shall, where practicable, be supplied from two or more feeders, one of which may be an emergency feeder.

(c) *Cargo spaces.* Separate feeders shall be provided for cargo space lighting. The distribution panels shall be located outside of the cargo spaces.

(d) *Emergency lighting feeders.* (1) For vessels provided with fire screen bulkheads forming fire zones, at least one emergency lighting feeder shall be provided to supply only the emergency lights between two adjacent main vertical fire zone bulkheads. The emergency lighting feeder shall be separated as widely as possible from the general lighting feeder(s) supplying the same space.

(2) On vessels fitted with an automatic emergency lighting and power system, a separate emergency lighting feeder shall be provided for emergency lights located in, or controlled from, the wheelhouse. A distribution panel for these lights with a fused switch or circuit breaker for each branch circuit shall be provided. Circuits to navigation lights not controlled by the navigation light panel, signal lights, and emergency lights on open decks, wheelhouse, chart room and fire control room shall be supplied from this wheelhouse distribution panel. The supply to the navigation light indicator panel shall be either a separate circuit from the emergency switchboard or a through feed, without switch or overcurrent protection, from the feeder supplying the wheelhouse emergency lighting panel. For overcurrent protection of the feeder supplying a navigation light panel see § 111.55–1(b)(9).

(3) On vessels provided with both a temporary and a final emergency lighting source of supply, a separate feeder to the wheelhouse shall be provided for the lifeboat floodlights. This feeder shall supply a distribution panelboard having a fused switch or circuit breaker for each branch circuit. This feeder may be connected to the final emergency lighting source of supply. On vessels without a temporary source of supply, these lights, when provided, may be supplied by the same feeder as other lights controlled from the wheelhouse.

§ 111.50–15 Lighting branch circuits and lighting requirements.

(a) *General requirements, branch circuits*—(1) *Passageways, public spaces, etc.* The supply to lights in passageways, public spaces, and berthing compartments accommodating more than 25 persons shall be divided between 2 or more branch circuits, one of which may be an emergency.

(2) *Machinery spaces.* Where practicable alternate groups of lights in an engine room, a boiler room, and an auxiliary machinery space shall be arranged so that the failure of one branch circuit will not leave large areas in darkness.

(3) *Lifeboat floodlights.* The arrangement of branch circuits to lifeboat floodlights required by paragraph (e) of this section shall be such that the floodlights at adjacent lifeboats are supplied by different branch circuits.

(4) *Signaling lamp circuit.* A separate branch circuit shall be provided to supply the signaling lamp(s) required by Subpart 113.60 of this subchapter. The branch circuit shall be supplied either from the emergency lighting panel required by subparagraph (d)(2) or from the final emergency source of emergency lighting and power as provided for in § 112.15–5(h) of this subchapter, or from a source as approved in the case of vessels not fitted with an emergency lighting and power system.

(b) *General lighting requirements*—(1) *Crew spaces and work spaces.* All spaces where members of the crew are regularly employed or quartered shall be adequately lighted. The minimum standard for natural lighting is that it will be possible on a clear day to read print such as that of an ordinary newspaper in any part of the clear working space. When it is not possible to provide adequate natural lighting, artificial lighting may be accepted on the same basis.

(2) *Washrooms, toiletrooms, etc.* Washrooms, toiletrooms, and hospital spaces are in particular to be well lighted.

(3) *Artificial lighting.* In every space apportioned to the crew, provision shall be made for efficient illumination at night and in dull weather by artificial lighting.

(4) *Berth lights.* Special provisions shall be made for berth lights for each member of the crew.

(c) *Berth lights.* Berth lights shall be permanently mounted and wired without the use of portable cords. The berth light shall have a minimum horizontal projection so that it will be difficult completely to cover the light with bedding.

(d) *Exit lights.* (1) Exit lights are required by § 78.47–40 of Subchapter H (Passenger Vessels) and Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(2) The word "Exit" shall be in red block letters not less than 2 inches high and of such type that it can be seen from a distance.

(e) *Lifeboat floodlights.* (1) Illumination for lifeboat launching operations is required by Part 33 of Subchapter D (Tank Vessels), Part 75 of Subchapter H (Passenger Vessels) and Part 94 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(2) Lifeboat floodlights shall be arranged so that the floodlights may be quickly directed either to the launching gear or to the lifeboat alongside. Means of training the floodlights shall be positive and shall not require the use of tools. The floodlights shall be connected to the supply circuit by means of a short length of heavy duty portable cord, Type S or the equivalent, and no receptacle outlet shall be employed.

(3) Vessels having liferafts, authorized in lieu of lifeboats for which approved launching devices are provided, shall be fitted with floodlights for illuminating the liferafts, launching devices, and water into which the liferafts are launched. Such floodlights shall be arranged as required by subparagraph (2) of this paragraph for lifeboats. Means shall also be provided for illuminating the stowage position of liferafts for which approved launching devices are not provided.

(f) *Receptacle outlets.* (1) A sufficient number of receptacle outlets shall be located throughout crew's accommodations to permit the use of electric razors, radios, and the like without using portable cords of excessive length.

(2) A sufficient number of receptacle outlets shall be located throughout the machinery spaces to permit lighting of any machine vital to the operation of the vessel with a portable light having a 75-foot portable cord. The requirements of this subparagraph shall be effective on vessels contracted for on or after November 19, 1956.

(g) *Pilot ladders.* Means shall be provided and used on all vessels engaged on voyages in which pilots are likely to be embarked at night for illuminating the pilot ladders.

§ 111.50–20 Circuit loads and demand factors.

(a) *General.* Generator, feeder and bus-tie cables shall be selected on the basis of a computed load of not less than the demand load given in Table 111.50–20(a).

TABLE 111.50–20 (a)—DEMAND LOADS

Type of circuit	Demand load
Generator cables..	125 percent of continuous generator rating.
Switchboard bus-tie, except ship's service to emergency switchboard bus-tie.	75 percent of generating capacity of the larger switchboard.
Emergency switchboard bus-tie.	125 percent of continuous rating of emergency generator.
Feeder supplying two or more motors.	125 percent of the rating of the largest motor plus 100 percent of the sum of the ratings of all other motors supplied and including 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.[1]
Feeder supplying two or more cargo winch motors arranged for the "Burtoning" method of cargo handling.	125 percent of the rating of the largest motor plus 35 percent of the sum of the ratings of all other motors supplied.[1]
Feeder supplying two or more 'tween deck cargo winch motors, cargo elevator motors, or cargo cranes.	125 percent of the rating of the largest motor plus 50 percent of the sum of the ratings of all other motors supplied.
Galley equipment feeder.	100 percent of either the first 50 KW or one-half the connected load, whichever is the larger, plus 65 percent of the remaining connected load, plus 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.
Lighting feeder....	100 percent of the connected load plus the average active circuit load for the spare switches or circuit breakers on the distribution panels.
Grounded neutral of a dual voltage feeder.	100 percent of the capacity of the ungrounded conductors when grounded neutral is not protected by a circuit breaker overcurrent trip, or not less than 50 percent of the capacity of the ungrounded conductors when the grounded neutral is protected by a circuit breaker overcurrent trip.

[1] Where a large number of motors are supplied from one feeder and the charactor of the load is such that not all motors will be operated simultaneously, a smaller demand load may be approved.

(b) *Motor branch circuits*—(1) *General.* The branch circuit cables for motor loads shall be not smaller than No. 14 AWG.

(2) *Individual motors.* Branch-circuit conductors supplying a single motor shall have a current carrying capacity not less than 125 percent of the motor full-load current rating. Minimum cable sizes are given in Table 111.45–20 (b3).

(3) *Wound-rotor secondary.* The conductors connecting the secondary of a wound-rotor alternating-current motor to its controller shall have a current carrying capacity not less than 125 percent of the full-load secondary current of the motor. Where the secondary resistor is separate from the controller, the current carrying capacity of the conductors between the controller and resistor shall be not less than 110 percent of the full-load secondary current.

(4) *Several motors.* Conductors supplying 2 or more motors shall have a current carrying capacity of not less than 125 percent of the full-load current rating of the highest rated motor in the group plus the sum of the full-load current ratings of the remainder of the motors in the group. Also see Table 111.50–20 (a).

(5) *Individual multi-speed motors.* For multi-speed motors the conductors between the controller and the motor windings or winding connections shall have a current-carrying capacity of not less than 125 percent of the full-load current rating of the associated winding or winding connection.

(c) *Lighting branch circuits*—(1) *General.* Lighting branch circuit conductors shall be not smaller than No. 14 AWG, except that taps to lampholders within a lighting fixture may be not smaller than No. 18 AWG where the branch circuit is protected by an overcurrent device rated or set at not more than 15 amperes.

(2) *15-ampere lighting branch circuits.* The connected load on a lighting branch circuit shall not exceed 12 amperes, computed on the basis of the lamp sizes to be installed, but in no case less than 50 watts per outlet unless the design of the fixture precludes the possibility of installing lamps of a higher wattage than those originally installed. Circuits supplying electric discharge type lamps shall be computed on the basis of ballast input current. Receptacle outlets provided for the convenience of passengers or crew to which no ship's service apparatus, such as room fans, desk lamps, table lamps, etc., will be connected, need not be counted as a connected load.

(3) *20-ampere lighting branch circuits.* Lighting branch circuits supplying only fixed nonswitched lighting fixtures for cargo hold or deck lighting may be supplied by 20-ampere branch circuits wired with not less than No. 12 AWG conductors provided all the following conditions are complied with:

(i) Fixture wire or portable cord, if employed in the lighting fixtures, shall not be smaller than No. 14 AWG.

(ii) The connected load shall not exceed 16 amperes.

(4) *30-ampere lighting branch circuits.* Lighting branch circuits supplying only fixed nonswitched lighting fixtures having only lampholders of the mogul type, or other lampholding devices required for lamps exceeding the maximum rating of medium-base lamps (300 watts), may be supplied by 30-ampere branch circuits wired with not less than No. 10 AWG conductors, provided all of the following conditions are complied with:

(i) Fixture wire, if employed, in wiring the lighting fixtures, shall be not less than No. 12 AWG.

(ii) The connected load shall not exceed 24 amperes.

(5) *Multi-lamp fixtures.* Multi-lamp fixtures employing a large number of low-wattage lamps, where the total load of the fixture exceeds 12 amperes, may be supplied by a polyphase branch circuit provided all the conditions covered in this subparagraph are complied with.

(i) The branch circuit is controlled from the distribution panelboard only by a common closing, common trip, circuit breaker having a pole for each circuit conductor.

(ii) The potential between any 2 conductors of the polyphase circuit does not exceed 120 volts.

(iii) The current in any conductor of the polyphase branch circuit does not exceed 12 amperes.

(d) *Appliance branch circuits.* Branch circuits which supply appliance loads, electric heater loads, and isolated small motor loads may be connected to distribution panelboards supplying lighting provided the required branch circuit capacity does not exceed 30 amperes.

(e) *Low voltage system, 0 to 50 volts*—(1) *Lighting.* Where a low voltage system is used for lighting, standard lamp sockets and receptacles shall be used, and no branch circuit is to be fitted with more than eight lamp sockets or receptacles. Each lighting branch circuit shall be wired with not less than No. 12 AWG conductors, and shall be protected by fuses of no greater capacity than 20 amperes, except that special circuits supplying appliances shall have receptacles of 20 ampere rating and shall be wired with not less than No. 10 AWG. Where a low voltage, low amperage system is used, such as for interior communication, no electrical connection is to be made to a standard voltage system unless specifically approved.

(2) *Engine starting.* Battery systems for engine starting purpose may be of the one-wire system. The ground lead shall be carried to the engine frame. Means shall be provided for removing the ground from the battery while the battery is being charged.

Subpart 111.55—Overcurrent Protection

§ 111.55–1 Installation of overcurrent devices.

(a) *General requirements.* Overcurrent protection for conductors is provided for the purpose of opening the electric circuit if the current reaches a value which will cause an excessive or dangerous temperature in the conductor or conductor insulation. A grounded conductor is considered to be protected from overcurrent if a protective device of a suitable rating or setting is provided in each ungrounded conductor of the same circuit, except as otherwise required by paragraph (d) of this section. For the minimum size of the grounded neutral conductor of a multiwire feeder see Table 111.50–20(a).

(b) *Overcurrent protection of conductors.* Conductors shall be protected in accordance with their current carrying capacities, as given in Tables 111.60–1 (e) (1) (i) and 111.60–1 (e) (1) (ii), except as follows:

(1) *Fuses.* If the allowable current-carrying capacity of the conductor does not correspond to a standard size fuse, the next larger size or rating may be used but not exceeding 150 percent of the allowable current-carrying capacity of the conductor. Plug fuses and fuseholders (see § 111.55–15(b)) shall not be used in circuits exceeding 125 volts between conductors. The screw shell of plug type fuseholders shall be connected to the load of the circuit.

(2) *Circuit breakers.* If the allowable current carrying capacity of the conductor does not correspond to a standard rating of circuit breakers, the next larger rating may be used but not exceeding 150 percent of the allowable current carrying capacity of the conductor. The effect of the temperature on the operation of thermally-controlled circuit breakers should be taken into consideration in the application of such circuit breakers when they are subjected to extremely low or extremely high temperatures.

(3) *Fixture wires or flexible cords.* Fixture wire or flexible cord, size No. 16 or No. 18, AWG, shall be considered as protected by 15-ampere overcurrent devices.

(4) *Motor branch circuits.* The conductors of motor branch circuits shall be considered as protected by the overcurrent protective devices specified by § 111.45–5 (b) through (g), and § 111.45–20.

(5) *Motor feeder circuits.* The conductor of motor feeder circuits shall be considered as protected by the overcurrent devices specified by § 111.45–25 (b).

(6) *Remote-control, electrical interlock, and indicator circuits.* The conductors of remote control, electrical interlock, and indicator circuits of motor controllers shall be considered as protected by the arrangements specified by § 111.45–10(b).

(7) *Appliance branch circuits.* The rating or setting of branch circuit overcurrent devices shall not be in excess of the current-carrying capacity of the circuit conductors except as provided in subparagraphs (1) and (2) of this paragraph. If the circuit supplies only a single appliance or device, the rating or setting of the branch circuit overcurrent device shall not exceed 150 percent of the rating of the appliance or device or 15 amperes whichever is the higher.

(8) *Lighting branch circuits.* Lighting branch circuits shall be protected against overcurrent either by fuses or by circuit breakers rated or set at not more than 15 amperes, except that 20-ampere lighting branch circuits complying with the provisions of § 111.50–20(c)(3) may be protected by overcurrent devices rated or set at no more than 20 amperes, and 30-ampere lighting branch circuits complying with the provisions of § 111.50–20(c)(4) may be protected by overcurrent devices rated or set at not more than 30 amperes, and low voltage lighting branch circuits may be protected in accordance with § 111.50–20(e).

(9) *Navigation light circuits.* The feeder supplying a navigation light panel shall be protected by overcurrent devices rated or set at not less than 30 amperes. The navigation light panel shall be fitted with 10-ampere main fuses and with 3-ampere branch circuit fuses as indicated on Figure 113.55–25 (b) of this subchapter.

(10) *Steering gear.* For overcurrent protection of steering gear branch circuits, see § 111.45–20 (h).

(c) *Thermal devices.* Thermal cutouts, thermal relays and other devices not designed to open short-circuits, shall not be used for protection of conductors against overcurrent due to short-circuits or grounds, but may be used to protect motor branch circuit conductors from overload if said devices are protected in accordance with § 111.45–5 (m).

(d) *Undergrounded conductors.* An overcurrent device (fuse or overcurrent trip unit of a circuit breaker) shall be placed in each undergrounded conductor, except that, on systems having a grounded neutral, a 2-wire branch circuit consisting of one ungrounded conductor and the grounded neutral conductor shall have overcurrent protection in each conductor. In such cases, the grounded neutral overcurrent device shall comply with paragraph (f) of this section. A branch or feeder switch or circuit breaker shall open all conductors of the circuit. Individual single-pole circuit breakers with operating handles yoked together may be used for the protection of each conductor of ungrounded 2-wire circuits.

(e) *Motors.* For motor-running protection the number of overcurrent units shall be as specified in § 111.45–5 (i), (j), and (k).

(f) *Grounded conductor.* No overcurrent device shall be placed in any permanently grounded conductor, except as permitted in this paragraph.

(1) *Simultaneous opening.* When the overcurrent device simultaneously opens all conductors of the circuit.

(2) *Motor-running protection.* For motor-running protection as provided in § 111.45–5 (i) and (j).

(g) *Protection of ship's service generators*—(1) *General.* Each generator of 25 kw. and over, and each generator regardless of size if arranged for parallel operation shall be protected by an individual trip-free air circuit breaker having inverse time overcurrent trips. The pickup setting of the long time overcurrent trip of the circuit breaker shall not exceed 115 percent of the generator rating for continuous rated machines and shall not exceed 15 percent above the overload rating for special rated machines. Each generator of less than 25 kw. not arranged for parallel operation may be protected by individual fuses in lieu of an individual circuit breaker.

(2) *Alternating current generators.* Where three or more generators are arranged for parallel operation, the circuit breakers shall have, in addition to

inverse time trips, instantaneous trips set at a value in excess of the maximum asymmetrical short circuit current available from the associated generator. In order to provide the optimum degree of protection for generators, the short time trips shall be set at the lowest values of current and time which will coordinate with the trip settings of feeder circuit breakers supplied by the generator to provide the continuity of service and high speed clearance specified in § 111.55–25.

(3) *Direct current generators.* In addition to the inverse time overcurrent trips, direct current generator circuit breakers shall be provided with an instantaneous trip set at the lowest value of current which will coordinate with the trip settings of feeder circuit breakers supplied by the generator to provide the continuity of service and high speed clearance specified in § 111.55–25.

(4) *Generator circuits for parallel operation.* Each direct-current generator arranged for parallel operaton shall be provided with a reverse current device. Each alternating-current generator arranged for parallel operation shall be provided with a reverse power relay.

(h) *Three-wire direct-current generators*—(1) *Circuit-breaker poles.* Separate circuit-breaker poles should be provided for the positive, negative, neutral and also for the equalizer leads unless protection is provided by the main poles. When equalizer poles are provided for the three-wire generators, the overload trips should be of the "Algebraic" type. No overload trip should be provided for the neutral pole, but it should operate simultaneously with the main poles. A neutral overcurrent relay and alarm system should be provided and set to function at a current value equal to the neutral rating.

(2) *Equalizer buses.* For 3-wire generators the circuit breaker shall protect against a short-circuit on the equalizer buses.

(3) *Neutral grounding, main switchboard.* The neutral of 3-wire dual-voltage direct-current systems should be solidly grounded at the generator switchboard with a zero center ammeter in the ground connection. The zero center ammeter shall have a full scale reading of 150 percent of the neutral current rating of the largest generator and be marked to indicate the polarity of grounds. The ground connection should be made in such a manner that it will not prevent checking the insulation resistance of the generator to ground before the generator is connected to the bus. The neutral of 3-wire d-c emergency power systems should be grounded at all times when supplied from the emergency generator or storage battery.

(4) *Neutral grounding, emergency switchboard.* No direct ground connection should be provided at the emergency switchboard, the neutral bus or buses being solidly and permanently connected to the neutral bus of the main switchboard. No interrupting device should be provided in the neutral conductor of the bus-tie feeder connecting the two switchboards.

(i) *Three-wire single-phase and four-wire three-phase generators*—(1) *Circuit-breaker poles.* Circuit-breaker poles shall be provided for each generator lead, including the neutral, except that where the generator disconnect switch is operable from the front of the switchboard, no generator circuit-breaker pole need be provided for the generator neutral.

(2) *Neutral grounding, main switchboard.* The neutral of dual-voltage alternating-current systems shall be solidly grounded at the generator switchboard with an ammeter in the ground connection. The ground connection shall be made in such a manner that it will not prevent checking the insulation resistance of the generator to ground before the generator is connected to the bus. The neutral of dual-voltage alternating-current emergency lighting and power systems shall be grounded at all times when supplied from the emergency generator or storage battery.

(3) *Neutral grounding, emergency switchboard.* The neutral bus of the emergency switchboard shall be grounded in the same manner as described for three-wire direct-current systems in paragraph (h) (4) of this section.

(j) *Propulsion circuits.* Overcurrent protection of propulsion motors, generators, and circuits will require special consideration in each case. For general requirements see § 111.35–25(j).

§ 111.55–5 Location of overcurrent protective devices.

(a) *Location in circuit.* Overcurrent devices shall be located at the point where the conductor to be protected receives its supply, except as covered in this paragraph.

(1) The overcurrent protective device for generator conductors shall be located on the generator switchboard.

(2) The overcurrent protection for shore connection conductors shall be located on the switchboard to which connected.

(3) If the overcurrent device protecting the larger conductors also protects the smaller conductors in accordance with Tables 111.60–1(e) (1) (i) and 111.60–1(e) (1) (ii).

(4) If (i) the smaller conductors have a current-carrying capacity of not less than the sum of the allowable current-carrying capacities for the conductors of the one or more circuits or loads supplied, and (ii) the tap is not over 5 feet long and does not extend beyond the switchboard, panelboard, or control device which it supplies.

(5) If the smaller conductors have a current-carrying capacity at least one-third that of the conductor from which they are supplied, and provided the tap is suitably protected from mechanical injury, is not over 25 feet long, and terminates in a single circuit breaker or set of fuses which will limit the load on the tap to that allowed by Tables 111.60–1(e) (1) (i) and 111.60–1(e) (1) (ii). Beyond this point the conductors may supply any number of circuit breakers or sets of fuses.

(b) *Location on vessel.* Overcurrent devices shall be located where they will be readily accessible; not exposed to mechanical injury; not in the vicinity of easily ignitable material nor where explosive gas or vapor may accumulate; and, preferably in combination with distribution panelboards, switchboards, motor controllers, etc.

§ 111.55–10 Enclosures for overcurrent protective devices.

(a) *General.* Overcurrent devices shall be enclosed in metal boxes or cabinets, unless a part of a specially approved assembly which affords equivalent protection, or unless mounted on switchboards, panelboards, or controllers located in compartments or enclosures free from easily ignitible material and accessible only to qualified persons. The operating handle of a circuit breaker may be accessible without opening a door or cover.

(b) *Exposed to weather.* Enclosures for overcurrent devices shall not be installed in locations exposed to the weather, unless unavoidable, in which case the enclosure shall be watertight.

(c) *Disconnection of fuses and thermal cutouts.* Disconnecting means shall be provided on the supply side of and adjacent to all cartridge fuses or thermal cutouts so that each individual circuit containing fuses or thermal cutouts can be independently disconnected from the source of electrical energy except as indicated in this paragraph.

(1) Instrument fuses located on switchboards operating at potentials not exceeding 600 volts need not have a disconnecting device provided a fuse puller is available.

(2) A single disconnecting means may be used to disconnect a group of circuits each protected by fuses or thermal cutouts under the conditions describe in § 111.45–30 (o).

(3) No disconnect means shall be provided for general alarm feeders and branch circuits covered by § 113.25–10(b).

(d) *Arcing or suddenly moving parts.* Arcing or suddenly moving parts shall comply with the requirements of this paragraph.

(1) Fuses and circuit breakers shall be so located or shielded that persons will not be burned or otherwise injured by their operation.

(2) Handles or levers of circuit breakers, and similar parts which may move suddenly in such a way that persons in the vicinity are liable to be injured by being struck by them, shall be guarded or isolated.

§ 111.55–15 Construction and use of overcurrent devices.

(a) *Fuse types prohibited.* Plug fuses of the Edison-base type and renewable link cartridge type fuses shall not be used.

(b) *Plug fuses and fuseholders of type S.* Plug fuses and fuseholders of type S may be employed for applications at not

over 125 volts; 0 to 15 amperes, and 16 to 30 amperes.

(c) *Cartridge fuses and fuseholders.* National Electrical Code Standard, nonrenewable cartridge fuses may be used for applications not exceeding 600 volts, 0 to 600 amperes. Special cartridge fuses may be used in instruments and the like when specifically approved.

(d) *Construction and marking of fuses.* Fuses shall be constructed in accordance with Underwriters' Laboratories, Inc., Standard for Fuses. Standard cartridge fuses shall be marked with the label of Underwriters' Laboratories, Inc. Special cartridge fuses shall be inspected under Underwriters' Laboratories, Inc., reexamination service.

(e) *Circuit breakers.* Circuit breakers shall conform to the requirements contained in this paragraph.

(1) *Method of operation.* In general, circuit breakers shall be capable of being closed or opened by hand without employing any other source of power, although normal operation may be by other power, such as electrical, pneumatic, and the like. Large circuit breakers which are to be closed and opened by electrical, pneumatic, or other power shall be capable of being closed by hand for maintenance purposes and shall also be capable of being tripped by hand under load without the use of power.

(2) *Injury to operator.* Circuit breakers shall be arranged and mounted so that their operation is not likely to injure the operator.

(3) *Indication.* Circuit breakers shall indicate whether they are in the open or closed position.

(4) *Non-tamperable.* An air circuit breaker, used for branch circuits, shall be of such design that any alteration of its trip point (calibration), or in the time required for its operation, will be difficult.

(5) *Marking.* Circuit breakers shall be marked with their rating in such a manner that the marking will be visible after installation.

(6) *Construction and interrupting rating.* The construction and rating of feeder and branch-circuit circuit breakers rated not more than 600 amperes and not more than 600 volts shall conform with the requirements of Underwriters' Laboratories, Inc., "Standard for Branch Circuit and Service Circuit Breakers" except as indicated in this subparagraph.

(i) Circuit breakers installed in engine rooms, boiler rooms and auxiliary machinery spaces shall be calibrated for an ambient temperature of 50° C. and circuit breakers so calibrated may be used in other locations.

(ii) Circuit breakers with interrupting ratings of over 10,000 amperes may be rated in accordance with the National Electrical Manufacturers Association's "Large Circuit Breaker Standard" or "Molded Case Circuit Breaker Standard," as applicable.

(7) *Removable from front.* Circuit breakers of the molded case type when installed on generator or distribution switchboards shall be mounted or arranged in such a manner that the circuit breaker may be removed from the front without first disconnecting copper or cable connections or deenergizing the supply.

§ 111.55–20 Interrupting rating of fuses and circuit breakers.

(a) *General.* Any circuit breaker or fuse installed at a point in the circuit where the maximum possible short-circuit current exceeds its interrupting rating shall be backed up by either, a circuit breaker of adequate interrupting rating with an instantaneous trip setting not more than 90 percent of the interrupting rating of the device protected, or by a suitable current limiting fuse. The back-up breaker or fuse nearest the source of power shall have an interrupting rating not less than the maximum short-circuit current available at the point where it is installed.

(1) *Current limiting fuses.* If a fuse is used as a back-up device, its selection and application shall be governed by the following design parameters:

(i) The maximum fuse rating shall be selected which will give adequate protection, on fault currents, to the device it backs up. In no case shall the device being backed up be called upon to interrupt fault currents in excess of 90 percent of its interrupting rating.

(ii) Fault currents cleared by the device backed up shall not cause damage or any change in the time-current characteristics of the current limiting fuse.

(iii) Fuses should be so applied that single phase operation of any three-phase connected motor will be precluded.

(2) *Fused circuit breakers.* Fused circuit breakers with fuses connected to the load side may be used for back-up service provided the fuses and circuit breakers are of coordinated design so that arc restrike in the circuit breaker cannot occur when a fuse blows.

(b) *Generator circuit breaker as back-up circuit breaker.* Generator circuit breaker(s) shall not serve as the back-up circuit breaker(s) for distribution or feeder circuit breakers.

(c) *Calculation of short-circuit currents.* Unless precise calculations are submitted for review, the maximum short-circuit current of a direct-current system will be assumed to be equal to ten times the combined normal rated current of all generators (including a spare) plus six times the combined normal rated current of all motors which may be in operation simultaneously. On alternating-current systems, the maximum short-circuit current will be assumed to be equal to ten times the combined normal rated current of all generators (including a spare) plus three times the combined normal rated current of all motors which may be in operation simultaneously.

§ 111.55–25 System protection.

(a) *General.* Insofar as is possible, the selection, arrangements and performance of the various overcurrent protective devices should be made with the following objectives in mind as described in this paragraph:

(1) *Continuity of service.* Continuity of service under short-circuit conditions through the selective operation of the various protective devices.

(2) *High speed clearance.* High speed clearance of low impedance short-circuits in order that short-circuit currents of large magnitude will cause minimum damage to the system and equipment and minimize the hazard of fire.

Subpart 111.60—Wiring Methods and Materials

§ 111.60–1 Electric cable.

(a) *General.* The intent and purpose of this section is to provide that conductors shall have mechanical strength, insulation, and current-carrying capacity adequate for the particular conditions under which they are used.

(b) *Construction.* Electric cables shall be constructed and tested by the manufacturer in accordance with the requirements of section 18, AIEE Standard No. 45.

(1) *Classes of cables.* The classes of cables covered by this standard are:

(i) Lighting and power cables;

(ii) Interior communication and telephone cable;

(iii) Inter-cabin telephone cable;

(iv) Bell wire; and,

(v) Switchboard wire.

(2) *Cable classes by type of insulation.* The above cables are classed in accordance with the type of conductor insulation as:

(i) Rubber insulated;

(ii) Varnished-cambric insulated;

(iii) Asbestos-varnished-cambric insulated;

(iv) Thermoplastic-asbestos insulated; and,

(v) Mineral insulated, Type MI.

(3) *Cable classes by type of mechanical covering.* The above cables are classed in accordance with the type of mechanical covering as:

(i) Armored;

(ii) Leaded and armored;

(iii) Impervious sheathed and armored;

(iv) Reinforced rubber sheathed and armored;

(v) Braided (applicable only to bell wire and switchboard wire); and,

(vi) Mineral insulated metal sheathed, Type MI.

(c) *Cable marking.* Cable complying with the requirements of this section shall be identified by providing a marker tape under the cable sheath. The marker tape shall give at regular and frequent intervals:

(1) Manufacturer;

(2) Applicable specification; and,

(3) Year of manufacture.

(d) *Cable applications*—(1) *Damp or wet locations.* Electric cable for installation in damp or wet locations shall be leaded and armored, reinforced rubber sheathed, and armored, impervious sheathed and armored, or mineral insulated-metal sheathed. The cable insulation may be either rubber, varnished-cambric, asbestos-varnished-cambric, thermoplastic asbestos or mineral insu-

lated, type MI, except that rubber insulated power and lighting cable shall not be used in locations where the ambient temperature exceeds 50 degrees C.

(2) *Corrosive locations.* The armor of cables in corrosive locations shall be either bronze or aluminum and the sheath on mineral insulated-metal sheathed cables shall be seamless annealed copper.

(3) *Dry locations.* Cables for installation in dry locations shall be either rubber insulated and armored or any of the cables specified in subparagraph (1) of this paragraph for damp or wet locations.

(4) *Power and lighting cable.* Cable for power and lighting applications shall be power and lighting cable of the types described in this subpart except that 600-volt thermoplastic-asbestos insulated interior communication cable may be used in control and indicating circuits of power and lighting equipment.

(5) *Interior communication and telephone cable.* Cable for interior communication apparatus operating on potentials not exceeding 300 volts shall be either interior communication cable, telephone cable, or power and lighting cable of the types described in this subpart.

(6) *Inter-cabin telephone cable.* Inter-cabin telephone cable may be used for telephone systems installed for the convenience of passengers or crew and not essential for the operation of the vessel.

(7) *Bell wire.* Bell wire may be used for call bell circuits of 25 volts or less installed for the convenience of passengers or crew if properly installed in protected raceways.

(8) *Switchboard wire.* Switchboard wire may be used only on switchboards, motor controllers and the like.

(e) *Current-carrying capacity*—(1) *General.* The maximum current-carrying capacities of electric lighting and power cables for continuous service are given in Tables 111.60–1(e)(1)(i) and 111.60–1(e)(1)(ii). The maximum current-carrying capacity of interior communication cable is 7.5 amperes.

(2) *Conductors in multiple.* Conductors may be run in multiple provided they are of the same length and have the same circular mil area and type of insulation. Where conductors are run in multiple, they shall be arranged and terminated at both ends in such a manner as to insure equal division of the total current between all conductors that are involved.

(f) *Temperature limitation.* No cable shall be used under such condition that its temperature, even when carrying current, will exceed the temperatures specified in Table 111.60–1 (e) (1) (i) for the type of insulation involved.

(g) *Conductor size for varnished-cambric insulated cables.* Varnished-cambric insulated power and lighting cables in sizes smaller than No. 12 AWG shall not be used. Rubber or asbestos-varnished-cambric insulated power and lighting cables may be used in size No. 14 AWG and larger.

TABLE 111.60–1(e)(1)(i)—WIRES AND CABLES[1]—MAXIMUM CURRENT-CARRYING CAPACITIES, DIRECT-CURRENT, FOR CONTINUOUS SERVICE, 50 DEGREES C. AMBIENT[2 3] (CONCENTRIC STRANDING, 600 VOLTS[4] OR LESS, DIRECT-CURRENT), (ALTERNATING-CURRENT RATINGS FOR CABLES ARE THE SAME AS GIVEN FOR DIRECT-CURRENT UP TO 700,000 CIRCULAR MILS; FOR 700,000 CIRCULAR MILS AND ABOVE, SEE TABLE 111.60–1(e)(1)(ii))

Conductor size		Current in amperes											
		1—conductor				2—conductor				3—conductor			
Area (circular mils)	Nearest AWG	R	VC	AVC	MI	R	VC	AVC	MI	R	VC	AVC	MI
2,000,000	----------	1,048	1,380	1,538	------	------	------	------	------	------	------	------	------
1,750,000	----------	[illegible]	1,231	1,373	------	------	------	------	------	------	------	------	------
1,500,000	----------	[illegible]	1,095	1,228	------	------	------	------	------	------	------	------	------
1,250,000	----------	743	970	1,020	------	------	------	------	------	------	------	------	------
1,000,000	----------	640	[illegible]	925	------	------	------	------	------	------	------	------	------
950,000	----------	617	[illegible]	904	------	------	------	------	------	------	------	------	------
900,000	----------	592	779	866	------	------	------	------	------	------	------	------	------
850,000	----------	578	752	[illegible]	------	------	------	------	------	------	------	------	------
800,000	----------	557	725	[illegible]	------	------	------	------	------	------	------	------	------
750,000	----------	538	[illegible]	776	------	------	------	------	------	------	------	------	------
700,000	----------	516	[illegible]	741	------	------	------	------	------	------	------	------	------
650,000	----------	486	623	[illegible]	------	382	[illegible]	560	------	331	428	476	------
600,000	----------	466	[illegible]	[illegible]	------	363	481	535	------	317	407	452	------
550,000	----------	441	563	627	------	[illegible]	462	514	------	[illegible]	386	[illegible]	------
500,000	----------	418	[illegible]	594	------	[illegible]	431	[illegible]	------	285	367	408	------
450,000	----------	392	[illegible]	[illegible]	------	[illegible]	406	452	------	[illegible]	341	[illegible]	------
400,000	----------	369	464	516	------	284	377	418	------	248	319	354	------
350,000	----------	340	429	477	------	261	351	[illegible]	------	230	[illegible]	[illegible]	------
300,000	----------	301	389	432	------	238	315	351	------	[illegible]	[illegible]	[illegible]	------
250,000	----------	270	348	387	------	212	281	312	------	188	238	264	------
212,000	4/0	241	310	345	308	193	254	[illegible]	------	[illegible]	215	[illegible]	------
168,000	3/0	[illegible]	273	[illegible]	264	167	223	248	------	148	187	[illegible]	------
133,000	2/0	180	237	264	228	145	[illegible]	214	------	130	163	181	------
106,000	1/0	155	206	229	196	128	170	189	------	112	142	[illegible]	------
83,700	1	133	177	197	168	111	148	165	------	[illegible]	[illegible]	135	------
66,400	2	115	152	169	144	[illegible]	128	142	------	[illegible]	106	118	------
52,600	3	[illegible]	132	147	124	[illegible]	111	[illegible]	------	75	[illegible]	102	------
41,700	[illegible]	85	114	127	108	74	97	108	72	[illegible]	[illegible]	89	72
33,100	5	71	[illegible]	110	[illegible]	64	[illegible]	[illegible]	[illegible]	[illegible]	70	78	63
26,300	6	63	86	96	80	[illegible]	74	82	[illegible]	[illegible]	61	67	56
20,800	7	[illegible]	74	82	------	49	[illegible]	71	------	44	[illegible]	58	------
16,500	[illegible]	46	66	73	[illegible]	42	55	[illegible]	40	[illegible]	46	[illegible]	40
10,400	10	[illegible]	[illegible]	[illegible]	[illegible]	32	[illegible]	47	32	29	35	39	[illegible]
6,530	12	24	32	35	32	[illegible]	27	[illegible]	24	21	[illegible]	[illegible]	[illegible]
4,110	14	15	------	[illegible]	[illegible]	14	------	19	[illegible]	13	------	17	[illegible]

[1] The values given in this table may be used provided the cable installation is limited to double banking. Where this limitation is exceeded, the values given in this table shall be decreased 5 percent for each additional bank.

[2] The values given in this table are based upon an ambient temperature of 50 degrees C and maximum conductor temperature of:

75 degrees C for rubber (R) insulated cables;
85 degrees C for varnished-cambric (VC) insulated cables; mineral insulated (MI) cables; and
95 degrees C for asbestos-varnished-cambric (AVC) insulated cables.

[3] If ambient temperatures differ from 50 degrees C the value shown above shall be multiplied by the following factors:

Type of cables	Ambient temperature		
	40° C	60° C	70° C
Rubber insulated cables	1.18	----------	----------
Varnished-cambric insulated cables and mineral-insulated cables	1.13	0.84	----------
Asbestos-varnished-cambric insulated cables	1.11	0.88	0.75

[4] For voltages greater than 600 volts, current rating shall be decreased 2 percent for each thousand volts increase over 600 volts.

TABLE 111.60–1 (e) (1) (ii)[1]—WIRES AND CABLES—MAXIMUM CURRENT-CARRYING CAPACITIES, A. C., FOR CONTINUOUS SERVICE (VALUES ARE IN AMPERES—600 VOLTS OR LESS) (ALTERNATING-CURRENT RATINGS FOR CABLES OF LESS THAN 700,000 CIRCULAR MILS ARE THE SAME AS THOSE FOR CABLES GIVEN IN TABLE 111.60–1 (e) (1) (i))

[60-cycle alternating current]

Conductor size	Concentrically stranded conductor			Annular conductor	
Area in circular mils	Rubber insulated	Varnished-cambric insulated	Asbestos-varnished-cambric insulated	Varnished-cambric insulated	Asbestos-varnished-cambric insulated
2,000,000	[illegible]	1,229	1,440	1,417	1,590
1,750,000	864	1,125	1,305	1,294	1,450
1,500,000	791	1,023	1,199	1,160	1,315
1,250,000	719	920	1,070	1,021	1,160
1,000,000	[illegible]	808	[illegible]	877	[illegible]
950,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	920
850,000	[illegible]	735	[illegible]	777	885
800,000	[illegible]	711	803	747	848
750,000	[illegible]	[illegible]	775	708	[illegible]
700,000	[illegible]	[illegible]	740	[illegible]	775

[1] Footnotes 1, 2, 3, and 4 of Table 111.60–1 (e) (1) (i) are applicable to this table.

(h) *Substitute cable.* Electric cable constructed in accordance with Military Specifications MIL–C–915 or MIL–C–2194 may be substituted for the equivalent AIEE type cable specified in this section. The maximum current for any conductor shall not exceed the current-carrying capacities specified in the publication "Cable Comparison Guide," NavShips 250–660–23.

(i) *Special purpose cable*—(1) *Instrumentation cable.* Electric cable constructed in accordance with Military Specifications MIL–C–915, MIL–C–2194 or MIL–C–23206 of the types TTHFWA, TTRSA, PI, 1SWA, 2SWA, 3SWA, may be used for instrumentation circuits to connect such items as indicator lights, sensors, selector switches, and pushbuttons where the voltage of the circuit does not exceed 100 volts. The maximum current for any conductor shall not exceed the current-carrying capacities specified in the publication "Cable Comparison Guide," NavShips 250–660–23.

(2) *Thermocouple cable.* Electric cable constructed in accordance with Military Specification MIL–C–915 of the types PBJX, PBTM and PBTX may be used as conductors between thermocouple sensors and their registering equipment.

(3) *Other types of cable.* Other types of cable will be given special consideration by the Commandant where the cable does not penetrate a watertight bulkhead and is suitably protected from mechanical damage.

§ 111.60–5 Portable electric cord and fixture wire.

(a) *General.* The construction of portable electric cords and fixture wire shall be in accordance with Underwriters' Laboratories, Inc., Standard for Flexible Cord and Fixture Wire.

(b) *Application, portable cords.* Portable cords may be used only for the connection of portable lamps or appliances and for the connection of stationary lamps or small stationary equipment not suitable for fixed wiring. When used they shall be of the type indicated in Table 111.60–5 (b). Types of portable cords other than those listed in Table 111.60–5 (b) and the uses for the types listed other than those uses permitted by this paragraph shall be subject to special investigation and shall not be employed before being approved.

(1) *Damp or wet locations or for hard service.* Portable cords for use in damp or wet locations or for hard service shall be type S, SO, ST, SJ, SJO, SJT, HS, HSJ, AFS, or AFSJ, and portable cords for use where exposed to oil or oil vapor shall be type SO or SJO.

(2) *Dry locations.* Portable cords for use in dry locations and not for hard services shall be type C, P, P–2, PD, PW, PW–2, K, HC, HPD, AVPD, or one of the types listed for damp or wet locations in subparagraph (1) of this paragraph.

(3) *Extra hard service.* Portable cords for use in damp or wet locations and requiring a length in excess of five feet shall be type S, SO, or ST.

(c) *Allowable current-carrying capacity.* The allowable current-carrying capacities of flexible cord and fixture wire are given in Table 111.60–5 (c).

(d) *Conductor size.* Portable cord or fixture wire shall not be smaller than No. 18 AWG.

(e) *Splices.* Portable cords shall be used only in continuous lengths without splices or taps.

(f) *Pull at joints and terminals.* Portable cords shall be so connected to devices and to fittings that tension will not be transmitted to joints or terminal screws. This shall be accomplished by a knot in the cord, winding with tape, by a special fitting designed for that purpose, or by other equivalent means.

(g) *Fixture wire, application.* Fixture wire may be used in the interior of lighting fixtures, instruments, and the like. When used, fixture wire shall be one of the types covered in this paragraph.

(1) Either type AF, SF–2, or SFF–2 fixture wire shall be used for applications where the temperature will exceed 90° C and for the wiring of all mogul-base screw-shell lampholders.

(2) Either type AF, SF–2, or SFF–2 fixture wire shall be used for wiring lighting fixtures provided with other than mogul-base screw-shell lampholders, except that type CF fixture wire may be used where the temperature does not exceed 90° C, types RFH–2 and FFH–2 fixture wire may be used where the temperature does not exceed 75° C, and types TF, TFF, RF–2, and FF–2 fixture wire may be used where the temperature does not exceed 60° C.

(h) *Fixture wire, voltage limitation.* Fixture wire shall not be used for applications exceeding 300 volts.

(i) *Fixture wire, stranded.* Fixture wire shall be of the stranded type.

(j) *Hook-up wire, application.* Hook-up wire for use within the components of alarm panels, IC equipment, and electronic control equipment shall be in accordance with § 113.05–10 of this subchapter.

TABLE 111.60–5 (b)—Portable Cords

Trade name	Type letter (National Electrical Code)	Maximum voltage	Conductor insulation	Braid on each conductor	Cord outer covering	Maximum temperature °C.	Use	
Lamp cord	C	300	Rubber	Cotton	None	60	Dry places	Not hard usage.
Twisted portable cord	PD	300	do	do	Cotton or rayon	60	do	Do.
Reinforced cord	P-2	300	do	do	Cotton over rubber filler	60	do	Do.
	P	600						
Moistureproof reinforced cord	PW-2	300	do	do	Cotton, moisture-resistant finish over rubber filler.	60	do	Do.
	PW	600						
Braided heavy duty cord	K	300	do	do	Two cotton, moisture-resistant finish.	60	do	Do.
Junior hard service cord	SJ	300	do	None	Rubber	[1] 60	Damp places	Hard usage.
	SJO		Thermoplastic or rubber.		Oil-resistant compound			
	SJT				Thermoplastic			
Hard service cord	S	600	Rubber	do	Rubber	60	do	Extra hard usage.
	SO		Thermoplastic or rubber.		Oil-resistant compound			
	ST				Thermoplastic			
Heater cord	HC	300	Rubber and asbestos	Cotton	None	90	Dry places	Not hard usage.
	HPD			None	Cotton or rayon			
Rubber-jacketed heater cord	HSJ	300	do	do	Cotton and rubber	[2] 60	Damp places	Hard usage.
Jacketed heater cord	HS	300	do	do	Cotton, and rubber or neoprene	[2] 90	do	Do.
Heat- and moisture-resistant cord.	AVPD	300	Asbestos and varnished cambric.	do	Asbestos, flame-retardant, moisture resistant.	110	Dry places	Not hard usage.
Rubber-jacketed heat-resistant cord.	AFSJ, AFS	300	Impregnated asbestos	do	Rubber	[3] 150	Damp places	Hard usage.
Elevator cable	E	300	Rubber	Cotton	Three cotton, outer one flame-retardant, moisture-resistant.[3]	60	Elevator lighting and control.	
	EO		Thermoplastic	Rayon	One cotton and neoprene jacket [3].			
	ET				Three cotton, outer one flame-retardant, moisture-resistant.[3]			

[1] The temperature limit for Type SJ, SJO, or SJT cord is 75° C instead of 60° C if both the conductor insulation and jacket employ compounds which are recognized as suitable for use at 75° C. Such cords are recognized specifically for use on electric refrigerators or in similar applications on appliances where cord replacement is not a problem. Such cords shall be marked by having a green thread (which indicates a temperature limit of 75° C) either immediately under the insulation or under the separator of one conductor.

[2] The temperature limit indicated applies only to the individual conductors where the cord is employed within an appliance. [3] The temperature limit on the jacket of Type HS rubber-jacketed heater cord and Type AFS or AFSJ rubber-jacketed heat-resistant cord is limited to 75° C. The temperature limit on the jacket of Type HSJ rubber-jacketed heater cord is limited to 60° C. unless the jacket is marked by means of indent printing or indelible-ink printing at intervals of two feet or less with the value 75° C.

[3] Rubber-filled or varnished-cambric tapes may be substituted for the inner braids.

TABLE 111.60-5 (c)—MAXIMUM CURRENT-CARRYING CAPACITIES IN AMPERES[1, 2]

Size AWG	Portable cord				Fixture wire	
	Rubber types C, E, EO, K, P, P-2, PD, PW, PW-2	Rubber types S, SO, SJ, SJO	Types AFS, AFSJ, HC, HPD, HS, HSJ	Type AVPD	Rubber types RF-2, FF-2, RFH-2, FFH-2	Thermoplastic types TF, TFF
	Thermoplastic type ET	Thermoplastic types ST, SJT				Cotton type CF
						Asbestos type AF
						Silicone rubber type SF-2 SFF-2
18	5	7	10	17	5	6
16	7	10	15	22	7	8
14	15	15	20	25	---	17
12	20	20	30	30	---	---
10	25	25	35	47	---	---
8	35	---	---	---	---	---
6	45	---	---	---	---	---
4	60	---	---	---	---	---
2	80	---	---	---	---	---

[1] If the number of current-carrying conductors in a cord exceeds three, the allowable current-carrying capacity of each conductor shall be reduced to 80 percent of the values in the table.
[2] In no case shall conductors be associated together in such a way with respect to the kind of circuit, the wiring method employed, or the number of conductors, that the limiting temperature of the conductors will be exceeded.

§ 111.60–10 Wire and cable installation.

(a) *Propulsion cables*—(1) *Splices and terminals.* Propulsion cables are to have no splices or joints except terminal joints and all cable terminals are to be effectively sealed against the admission of moisture or air; similar precautions should be taken during installation by sealing all cable ends until the terminals are permanently attached. Cable supports are to be strong enough to withstand short-circuited conditions; they are not to be spaced more than 36 inches apart and are to be arranged to prevent chafing of the cable.

(2) *Single-conductor alternating-current cables.* Single-conductor alternating-current cables are to be supported on non-fragile insulators and the protective metal covering of each run of cable should be grounded at the middle only. Closed magnetic circuits around individual cables are not permitted and magnetic materials between cables of a group should be avoided. In order to minimize harmful inductive effect, cables in groups of considerable length should be transposed.

(3) *Multi-conductor alternating-current cables.* Multi-conductor alternating current cables are to be mounted on approved supports and the lead sheath grounded at several points.

(4) *Deck and bulkhead penetrations.* Deck and bulkhead penetration shall comply with the requirements of paragraph (b) (4) of this section.

(b) *Ships' service cables*—(1) *Cable joints and sealing.* The cable ends of all feeders and power branch circuits to vital auxiliaries are to be effectively sealed against the admission of moisture by methods such as taping in combination with insulating compound or, in the case of type MI, by fittings designed for that purpose.

(2) *Cable supports and radii of bends.* Where cables are run in groups they shall be supported in metal hangers arranged as far as practicable to permit painting of the surrounding structure without undue disturbance to the installation. Single cable runs may be supported by metal clips screwed directly to deck or bulkhead except on watertight bulkheads. Cables grouped in a single hanger shall be limited to two banks. Supports shall be spaced no more than 18 inches apart where vertical and 14 inches where horizontal. Cables shall be strapped in position at every hanger on vertical runs and at not less than every fourth hanger on horizontal runs, except that at turns of horizontal runs the cable shall be strapped at each hanger. Cables running transversely to and supported by clips or straps on the under side of beams shall be run on backing plates, cable racks, or the equivalent. Metal supports shall be designed to secure cable without damage to insulation or armor and shall be so arranged that the cables will bear over a length of at least ½ inch. Leaded and armored cables shall not be bent to a smaller radius than 8 cable diameters; other cables may be bent to a 6-cable-diameter radius.

(3) *Alternating-current cable installations.* In order to avoid over-heating by induction, all phase wires should be contained within the same armor by use of multiple conductor cables. Single-conductor cables may be used, however, where carrying negligible currents or where there are no closed magnetic circuits around the individual cables.

(4) *Deck and bulkhead penetrations.* Where cables pass through watertight decks or bulkheads, a watertight stuffing tube shall be employed. Where cables pass through nonwatertight bulkheads, beams, or similar structural parts where the bearing surface is less than ¼-inch, the holes shall be fitted with bushings having rounded edges and a bearing surface for the cable of at least ¼-inch in length. Where cables pass through nonwatertight bulkheads, deck beams, or similar structural parts where the bearing surface is ¼-inch or greater in length, all burrs shall be removed in way of the hole and sharp edges shall be eliminated. Where cables pierce main vertical zone bulkheads, arrangements shall be made to ensure that the fire-resistance of the bulkheads is not impaired.

(5) *Grounding of cable metallic covering.* Each metallic-sheathed cable and each armored cable are to have the metallic covering electrically and mechanically continuous and grounded to the metal hull at each end of the run, except that final subcircuits may be grounded at the supply end only.

(6) *Mechanical protection.* All cables in bunkers and where particularly liable to damage such as locations in way of cargo ports, hatches, tank tops, and where passing through decks, shall be protected by removable metal coverings, angle irons, pipe or other equivalent means. All such metallic coverings are to be electrically continuous and grounded to the metal hull. Horizontal pipes or the equivalent used for cable protection should be provided with drainage holes, and, where they are carried through decks or bulkheads, arrangements should be made to insure the integrity of the water-or-gas-tightness of the structure.

(7) *Generator cables.* Generator cables are not to be installed in the bilges.

(8) *Feeder and branch circuit cables.* Cable of every description shall be located with a view to avoiding, as far as practicable, spaces where excessive heat and gases may be encountered as well as spaces where they may be exposed to damage such as exposed sides of deck houses. Electrical conductors shall not enter oil tanks and shall avoid cofferdams adjacent to and extending below the tops of oil tanks except as permitted by §§ 111.70–10 and 111.60–40.

(9) *Cables behind paneling.* Cables may be installed behind paneling provided all connections are readily accessible and the location of concealed connection boxes is indicated.

(10) *Cables behind sheathing.* Cables may be installed behind sheathing but they must not be installed behind nor imbedded in structural insulation; they should pass through such insulation at right angles and should be protected by continuous pipe with a stuffing tube at one end. For deck penetrations this stuffing tube should be at the upper end of the pipe and for bulkhead penetrations it should be on the uninsulated side of the bulkhead. For refrigerated space insulation the pipe should be of a phenolic or similar heat insulating material joined to the bulkhead stuffing tube or a section of such material should be inserted between the bulkhead stuffing tube and the metallic pipe.

(11) *Bell wire.* Bell wire may be run in tubing or moulding or the equivalent. All splices are to be made at outlets or connection boxes.

(12) *Lightning ground conductor.* Lightning ground conductor should be fitted to each wooden mast or topmast. They need not be fitted to steel masts.

§ 111.60–15 General requirements for wiring methods.

(a) *Feeder and branch continuity.* Each feeder and each branch circuit cable supplying a single energy consuming appliance, shall be continuous throughout their lengths, except that a cable of large size or exceptional length may be spliced in a suitable junction box to effect greater ease of installation and except for cables that may be extended as permitted by paragraph (f) of this section.

(b) *Boxes at outlets.* An outlet box shall be installed at each outlet, switch, receptacle, or junction point. In the complete installation, each outlet or junction box shall be provided with a cover unless a fixture canopy, switch cover, receptacle cover, etc., is used.

(c) *Cables entering boxes.* Cables entering boxes or fittings shall be protected from abrasion, and shall conform to the requirements of this paragraph.

(1) Opening through which conductors enter shall be adequately closed.

(2) The cable armor shall be secured to the box or fitting.

(3) In damp or wet locations, the cable entrance shall be made watertight by means of a terminal or stuffing tube, except that cables entering the bottom of drip-proof enclosures need not be made watertight.

(d) *Splices and taps.* (1) Conductors shall be so spliced or joined as to be mechanically and electrically secure without solder and, unless an approved splicing device is used, shall then be either soldered with a fusible metal or alloy, or brazed or welded. All splices and joints shall be covered with an insulation equivalent to that on the original conductor.

(2) If not subjected to a temperature higher than 75 degrees C, a splice or joint shall be covered with rubber or thermosplastic tape secured in place by an outer winding of friction tape, or with a standard combination tape or as specified in subparagraph (3) or (4) of this paragraph.

(3) If subjected to a temperature higher than 75 degrees C but not higher than 90 degrees C, a splice or joint shall be covered with asbestos cord or tape secured in place by an outer winding of friction tape or bonded with water-glass (sodium silicate) or as specified in subparagraph (4) of this paragraph.

(4) If subjected to a temperature higher than 90 degrees C, a splice or joint shall be covered with asbestos cord or tape bonded with water-glass.

(5) Other methods of insulating splices and taps, such as wrapping with layers of varnished-cambric tape followed by painting with insulating varnish, when properly done, are also acceptable.

(6) Rubber and thermoplastic insulating tapes shall be of a type listed as approved by Underwriters' Laboratories, Inc.

(e) *Connections to terminals.* (1) Connection of conductors to terminal parts shall insure a thoroughly good connection without damaging the conductors and shall be made by means of pressure connectors, solder lugs, or splices to flexible leads either soldered, brazed, or welded, except that No. 10 or smaller conductors may be connected by means of clamps or screws with terminal plates having upturned lugs. Terminals for more than one conductor shall be of a type approved for that purpose.

(2) Connectors, or lugs of the set-screw type shall not be used with stranded conductors smaller than No. 14 AWG unless provided with a nonrotating follower traveling with the set screw and making pressure contact with the conductor.

(3) Pressure-type wire connectors, fixture splicing connectors, and lugs shall conform to the requirements of Underwriters Laboratories, Inc., Standard for Wire Connectors and Soldering Lugs, and shall be so listed by Underwriters Laboratories, Inc.

(4) Terminal blocks shall employ terminal screws not smaller than 6–32, and spacings not less than that shown in Table 111.60–15 (e) (4).

TABLE 111.60–15 (e) (4)—Terminal Block Spacings

Voltage involved	Minimum spacings in inches between parts of opposite polarity and between live parts and ground	
	Through air	Over surface
0–250	¼	⅜
251–600	⅜	⅜

(f) *Extending feeder and branch circuit cables.* Existing feeder and branch circuit cables may be extended for vessels receiving major alterations provided the requirements of this paragraph are met.

(1) The cables shall be spliced in suitable junction boxes.

(2) Each vital and emergency circuit shall be spliced in individual, suitable junction boxes.

(3) Circuits of different voltages shall not be extended by means of a common cable or junction box.

(4) Existing cables of less than 25 feet in length shall not be extended but shall be replaced.

§ 111.60–20 Outlet boxes.

(a) *General.* The requirements of this section are applicable to outlet boxes for use with lighting fixtures, wiring devices, and the like, including separately installed connection and junction boxes, having a volume of not more than 100 cubic inches. Boxes of large size will require special consideration.

(b) *Size.* Outlet boxes shall have an internal depth of at least 1½ inches, except that when an outlet box is incorporated in a fixture the depth may be decreased to not less than 1 inch provided the outlet box volume is not less than 20 cubic inches. The free space within an outlet box for each conductor, not counting fixture wires, shall be not less than that given in Table 111.60–20 (b). Table 111.60–20 (b) applies where no fitting or devices, such as cable clamps, hickeys, switches or receptacles are contained in the box. Where one or more such devices are contained in the box, each such device shall count as one conductor. Each conductor terminated in the box is counted as one conductor.

TABLE 111.60–20 (b)—Outlet Box Size

AWG size of conductor, No.	Free space in cubic inches for each conductor within box
14	2.0
12	2.25
10	2.5
8	3.0

(c) *Degree of enclosure.* Outlet boxes for use in damp or wet locations shall be of watertight construction.

(d) *Mounting and grounding.* Outlet boxes shall be securely fastened in place and grounded to the hull of the vessel. Outlet boxes of watertight construction shall have external mounting feet or lugs.

(e) *Penetration of walls.* Holes in the walls of watertight outlet boxes for the purpose of providing means for the attachment of parts on the exterior or interior thereof, or for securing the cover and the like, shall not penetrate the total thickness of the box wall.

(f) *Construction.* The construction of outlet boxes shall conform with the requirements of Underwriters' Laboratories, Inc. Standard for Outlet Boxes and Fittings, except that sheet steel outlet boxes shall not be installed in corrosive locations.

§ 111.60–25 Switches and circuit breakers.

(a) *General requirements*—(1) *Grounded conductor.* No switch or circuit breaker shall disconnect the grounded conductor of a circuit unless the switch or circuit breaker simultaneously disconnects the ungrounded conductor or conductors.

(2) *Three-way and four-way switches.* Three-way and four-way switches shall be so wired that all switching is done only in the ungrounded circuit conductor.

(3) *Enclosures.* Switches and circuit breakers, except pendant and surface type snap switches and knife switches mounted on an open face switchboard or panelboard, shall be of the externally operative type enclosed in metal boxes or cabinets.

(4) *Position of knife switches.* Single-throw knife switches shall be so placed that gravity will not tend to close them. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal as preferred, but if the throw be vertical a locking device shall be provided which will insure the blade remaining in the open position when so set.

(5) *Circuit connections.* Knife switches, unless of the double-throw type, shall be so connected that the blades are dead when the switch is in the open position. Circuits shall be connected to the fuse end of switches and to the coil end of circuit breakers, except that generators or incoming feeders may

be connected to either end of circuit breakers.

(6) *Accessibility and grouping.* Switches and circuit breakers, so far as practicable, shall be readily accessible and shall be grouped.

(7) *Circuit breakers as switches.* A circuit breaker operable directly by applying the hand to a lever or handle may serve as a switch provided it has the number of poles required for such switch.

(8) *Grounding of enclosures.* Enclosures for switches or circuit breakers shall be grounded.

(9) *Knife switches.* Knife switches rated for more than 1,200 amperes at 250 volts or less, and for more than 600 amperes at 251 to 600 volts shall be used only as isolating switches and shall not be opened under load. To interrupt currents greater than 1,200 amperes at 250 volts or less, or 600 amperes at 251 to 600 volts, a circuit breaker or a switch of special design approved for such purpose shall be used. Knife switches of lower rating may be used as general-use switches and may be opened under load. Motor-circuit switches may be of the knife-switch type. (See § 111.45–30 (d), (e), and (f).)

(10) *Rating of snap switches.* Snap switches shall be rated as described in this paragraph depending upon the load controlled.

(i) *Non-inductive loads.* For non-inductive loads other than tungsten-filament lamps, switches shall have an ampere rating not less than the ampere rating of the load.

(ii) *Tungsten filament lamp loads.* For tungsten-filament lamp loads, and for combined tungsten-filament and non-inductive loads, switches shall have a "T" rating not less than the ampere rating of the load.

(iii) *Inductive loads.* Switches controlling inductive loads shall have an ampere rating twice the ampere rating of the load unless they are of a type approved as part of an assembly or for the purpose employed.

(iv) *Motor-circuit switches.* For switches controlling motors see §§ 111.45–30 and paragraph (b) (4) of this section.

(b) *Detail requirements*—(1) *Circuit breakers.* Circuit breakers shall comply with § 111.55–15 (e).

(2) *Knife switches.* The construction of knife switches shall conform to the requirements of Underwriters' Laboratories, Inc. Standard for Knife Switches.

(3) *Snap switches.* The construction of snap switches shall conform with the requirements of Underwriters' Laboratories, Inc. Standard for Snap Switches and the switches shall be so labeled. The switches when installed in an outlet box and wired shall have a minimum spacing between live parts and ground of ¼-inch through air or over surfaces for potentials of 250 volts or less.

(4) *Enclosed switches.* Enclosed switches shall conform to the requirements of Underwriters' Laboratories, Inc. Standard for Enclosed Switches, except that sheet metal enclosures shall not be employed for use in corrosive locations unless one of the conditions covered in this subparagraph is complied with.

(i) The enclosure is fabricated of corrosion-resistant material.

(ii) The enclosure is fabricated of sheet steel not less than ⅛ inch in thickness and hot dip galvanized after fabrication.

(iii) The enclosure is fabricated of sheet steel not less than 3/16 inch in thickness and given a corrosion-resistant finish in accordance with § 110.15–40 of this subchapter.

§ 111.60–26 Shore connection boxes.

(a) Shore connection boxes shall be of ample size to accommodate the connections of the portable and fixed cables, and shall be of watertight construction when installed in damp or wet locations.

(b) Shore connection boxes for installation in corrosive locations shall not be constructed of sheet metal unless the conditions of § 111.60–25 (b) (4) (i), (ii), or (iii) are met.

(c) The minimum spacing between live parts and between live parts and ground in shore connection boxes shall meet the requirements of Table 111.35–5 (d). Means other than friction between parts shall be provided to prevent cable lugs from rotating.

(d) Shore connection boxes shall be arranged for bottom entrance of portable cable and shall provide a protected enclosure while in use.

§ 111.60–30 Receptacle outlets and attachment plugs.

(a) Receptable outlets and attachment plugs for the attachment of portable lamps, tools, and similar apparatus supplied as ship's equipment and operating at 100 volts or more, shall provide a grounding pole and a grounding conductor in the portable cord to ground the dead metal parts of the portable apparatus. For portable devices made entirely of non-conducting material or so constructed that dead metal parts will not become energized under any conditions, the grounding conductor in the portable cord and the grounding pole of the attachment plug need not be furnished. Portable apparatus shall be deemed to be any apparatus served by means of a flexible extension cord, whether the apparatus is permanently mounted or not.

(b) Receptacle outlets provided for the convenience of, and located in quarters, for, passengers or crew for connecting portable appliances operating at 100 volts or more, shall provide a grounding pole.[1]

(c) Receptacle outlets of the type providing a grounding pole shall be of a distinctive design that will not permit the dead metal parts of portable apparatus to be connected to a live conductor.

(d) Receptacle outlets for use in damp or wet locations shall be so designed that, when the plug is in place, the plug will be held in positive contact and will establish and maintain a watertight integrity of the enclosure.

(e) Receptacle outlets for use in damp or wet locations shall be so designed that, when the plug is not in place, the plug opening may be closed to establish and maintain a watertight integrity of the enclosure. Where threaded caps are used for this purpose, the cap shall be mechanically fastened to the cover or enclosure by a strong link or hinged strap.

(f) Receptacle outlets for use in locations exposed to the weather shall be so designed that with the plug opening uncovered, water will not collect in the interior of the box.

(g) Receptacle outlets for use in locations where accessible to other than qualified persons shall, with the plug opening uncovered, present no live parts. Any screw, rivet, contact, or the like which is accessible and in electrical connection with any live-metal part shall be located in a hole not more than 9/32 inch in diameter and recessed not less than 3/16 inch in the clear.

(h) When it is necessary to transmit current in one direction between two receptacle outlets by means of a portable cable with a plug on each end (such as a battery charging lead between a receptacle outlet on a ship and a receptacle outlet in a lifeboat), the plug which may be energized when not inserted in the receptacle outlet, shall be of the female type. When receptacle outlets may be used as a source of power as well as to receive power (such as the receptacles on barges that may have to supply power to adjoining barges in some make-ups and receive power from the towboat or adjoining barge in other make-ups) the receptacles shall be of the male, reverse service type. Plugs of associated portable cable shall be of the female type and shall be provided at both ends of the portable lead. The female type plug specified in this paragraph shall comply with the requirements of paragraph (g) of this section.

(i) A receptacle outlet installed on a lifeboat for the purpose of connecting it to the ship's electrical system shall be of a type that will permit the plug to pull free should the lifeboat be lowered.

(j) Where receptacle outlets on a ship are connected to different potentials, or to different types of potentials, receptacle outlet types shall be selected so that a portable device cannot be plugged into a receptacle outlet of an unsuitable potential.

(k) Receptacle outlets and plugs for use in damp or wet locations shall be constructed of corrosion-resistant material(s), or of a material(s) with a corrosion-resistant finish(es), except that receptacle outlets and plugs for use in corrosive locations shall be constructed of corrosion-resistant material(s).

(l) Receptacle outlets and plugs when installed and wired shall have a minimum spacing between live parts and ground of ¼ inch through air or over surface for potentials of 250 volts or less.

(m) Interior units of receptacle outlets and plugs shall conform to the re-

[1] Applicable to vessels contracted for on or after January 1, 1964. Vessels contracted before January 1, 1964 need not provide a type with grounding pole if operating at 125 volts or less.

quirements of Underwriters' Laboratories, Inc. Standard for Attachment Plugs and Receptacles.

§ 111.60–35 Lighting fixtures.

(a) *General requirements.* (1) Construction details shall be in accordance with Underwriters' Laboratories, Inc., Standard for Marine Type Electric Lighting Fixtures Subject 595.

(2) Open arc lamps shall not be used for applications other than for searchlights and for motion picture projectors.

(3) Fixture globes shall be protected by guards except in living quarters, wheelhouse, gyro room, radio room, galley, and similar spaces where not subject to mechanical damage.

(4) Fixtures shall be of such construction, or so installed, that the conductors in outlet boxes will not be subjected to temperatures greater than that for which the conductors are approved (75° C. for rubber insulated conductors, 85° C. for varnished-cambric insulated and mineral-insulated conductors, 95° C. for asbestos - varnished-cambric insulated conductors, and 105° C. for MIL–C–2194 type SGA cable). For the purpose of this section, an ambient temperature of 25° C. will be assumed for passenger and crew quarters, public spaces, cargo spaces, and open deck areas, an ambient temperature of 40° C. will be assumed for auxiliary machinery and work spaces, and an ambient temperature of 50° C. will be assumed for the engine and boiler rooms.

(5) Fixtures shall be so constructed, or installed, or equipped with shades and/or guards that combustible material will not be subjected to temperatures in excess of 90° C.

(6) Fixtures shall not be used as connection boxes for circuits other than the branch circuit supplying the fixture except that two or more circuits may supply the fixture when:

(i) One or more lamps of a multilamp fixture are supplied from an emergency lighting circuit; or

(ii) When the number of lamps of a fixture exceeds the capacity of a single circuit. When more than one circuit is employed in a fixture, the circuits shall be as widely separated as possible and the different circuits clearly identified at terminal points. Also see § 111.50–20 (c) (5).

(7) For wiring of explosion-proof equipment see § 111.60–40.

(b) *Lighting fixture installations.* (1) Fixtures installed in locations exposed to the weather and in other locations occasionally exposed to splashing water shall be of watertight construction. Fixtures installed in other wet or damp locations shall be of at least dripproof construction as installed.

(2) Any combustible bulkhead or ceiling finish exposed between the edge of a fixture canopy or pan and the outlet box shall be covered with noncombustible material.

(3) In a completed installation, each outlet box shall be provided with a cover unless it is covered by means of a fixture canopy, lampholder, or similar device.

(4) Fixtures, lampholders, and receptacle outlets shall be securely supported. Fixtures shall not be supported by the screw shell of a lampholder.

(5) Pendent fixtures shall be suspended by, and supplied through threaded rigid conduit stems.

(6) Table lamps, desk lamps, floor lamps, and similar equipment shall be secured in place to prevent displacement by the roll or pitch of the vessel.

(c) Grounding of lighting equipment. (1) Lighting equipment (including fixtures) shall be grounded.

(2) Equipment shall be considered as grounded when mechanically connected in a permanent and effective manner to the metal structure of the ship, the armor of armored cable, or a grounding connector.

§ 111.60–40 Wiring methods and materials for hazardous locations.

(a) *General.* (1) The provisions of this section apply to locations in which equipment and wiring are subjected to the conditions indicated by the classifications covered by subparagraphs (7) through (9) of this paragraph. It is necessary that each compartment or area containing electrical equipment be considered individually in order to determine its hazard classification. Except as modified by this section, all other applicable rules contained in this subchapter shall apply to electrical equipment and wiring installed in hazardous locations.

(2) The term "explosion-proof" as used in this section shall mean enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(3) Through the exercise of ingenuity in the layout of electrical installations for hazardous locations, it is frequently possible to locate much of the equipment in less hazardous or nonhazardous areas and thus reduce the amount of special equipment required. The amount of electrical equipment or wiring in hazardous locations shall be minimized.

(4) The intent of this section is to require a form of construction of equipment, and of installation that will insure safe performance under conditions of proper use and maintenance. It is necessary, therefore, that more than ordinary care be exercised with regard to the installation and maintenance of equipment and wiring in hazardous areas.

(5) Explosion-proof switches and switches controlling explosion-proof equipment shall have a pole for each circuit conductor.

(6) The explosive characteristics of various atmospheric mixtures of hazardous gases, vapors and dusts depend on the specific hazardous material involved. It is necessary, therefore, that equipment be designed not only for the class of location but also for the specific gas, vapor or dust that will be present. For the purpose of approval, the following atmospheric mixtures have been grouped on the basis of their explosive characteristics:

Group A: Atmospheres containing acetylene;
Group B: Atmospheres containing hydrogen, or gases or vapors of equivalent hazard, such as manufactured gas;
Group C: Atmospheres containing ethyl ether vapor;
Group D: Atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors, and natural gas;
Group E: Atmospheres containing metal dust;
Group F: Atmospheres containing carbon black, coal or coke dust; and
Group G: Atmospheres containing grain dust.

(7) Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitible mixtures.

(i) This classification would usually include locations such as cargo pump rooms, cofferdam areas, and in some cases open deck areas, storage and mixing rooms for paint and allied products, storage rooms for oil, oil lamps and the like, battery rooms, and hospital operating rooms in which combustible anesthetics may be administered.

(ii) Special limitations and requirements for electrical installations in hazardous locations on tank vessels are contained in Subpart 111.70.

(8) Class II locations are those in which combustible dust is or may be in the air continuously, intermittently, or periodically under normal conditions, in quantities sufficient to produce explosive or ignitible mixtures.

(i) This classification would usually include the working areas handling bulk grain and similar products, coal pulverizing plants (except where the pulverizing equipment is essentially dust-tight), and the like.

(9) Class III locations are those in which easily ignitible fibers or materials producing combustible flyings are handled or used.

(i) Easily ignitable fibers and combustible flyings will include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste, kapok, Spanish moss, excelsior, sawdust, and other materials of similar nature.

(ii) Class III locations will usually include areas where the above products are handled in bulk, and in carpenter shop and similar locations.

(b) *Electrical installations in Class I, Groups A, B, C, and D, hazardous locations*—(1) *Meters, instruments and relays.* Meters, instruments, and relays, including kilowatt-hour meters, instrument transformers and resistors, rectifiers and thermionic tubes, shall be provided with explosion-proof enclosures approved for Class I locations.

(2) *Switches, circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor controllers and fuses, including pushbuttons, relays and similar devices, shall be provided with enclosures, and the enclosures in each case

together with the enclosed equipment shall be approved as a complete assembly for use in Class I locations.

(3) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, together with any switching mechanism associated with them, shall be provided with explosion-proof enclosures approved for Class I locations.

(4) *Motors and generators.* Motors, generators and other rotating electrical machinery shall be of enclosed explosion-proof type approved for Class I locations.

(5) *Lighting fixtures.* Each lighting fixture shall be approved as a complete assembly for class I locations, and shall be clearly marked to indicate the maximum wattage of lamps for which it is approved. Fixtures intended for portable use shall be specifically approved as a complete assembly for that use.

(i) *Mechanical injury.* Each fixture shall be protected against mechanical injury by a suitable guard. Pendent fixtures having rigid conduit stems longer than 12 inches shall have permanent and effective bracing against lateral displacement.

(ii) *Support.* Boxes, box assemblies or fittings used for the support of lighting fixtures shall be approved for the purpose and for Class I location.

(6) *Appliances, fixed and portable.* Appliances, including electrically heated and motor-driven appliances, shall be approved for Class I locations.

(7) *Flexible cords.* A flexible cord may be used only for connections between a portable lamp or a portable appliance and the fixed portion of its supply circuit and where used shall be of a type approved for extra hard usage; shall contain, in addition to the conductors of the circuit, a grounding conductor; shall be connected to terminals or to supply conductors in an approved manner; shall be supported by clamps or by other suitable means in such a manner that there will be no tension on the terminal connections; and shall be provided with suitable seals where the flexible cord enters boxes, fittings, or enclosures of explosion-proof type.

(i) Where flexible cords may be exposed to liquids having a deleterious effect on rubber, they shall be of a type approved for use under such conditions.

(8) *Receptacle outlets and attachment plugs.* Receptacle outlets and attachment plugs shall be of the polarized type providing for connection to the grounding conductor of the flexible cord and shall be approved for Class I locations.

(9) *Signal, alarm, remote-control and communication systems.* Signal, alarm, remote-control and communication systems, irrespective of voltage, shall be approved for Class I locations.

(10) *Wiring methods.* (i) Electric cables shall be leaded and armored, or impervious sheathed and armored, or mineral-insulated metal sheathed.

(ii) The cable entrance to each explosion-proof device shall be sealed to prevent the passage of gases, vapors, or flames from within the explosion-proof enclosure.

(iii) The seal fitting shall be located as close as practicable to, but in no case more than 18 inches from, the enclosure, and shall be connected thereto by means of a short length of rigid metal conduit with threaded explosion-proof joints each having at least 5 full threads engaged. Type MI cables, however, shall enter enclosures directly through explosion-proof fittings especially approved for Class I locations.

(iv) Except for type MI cables, all cable covering except the individual conductor insulation shall be removed in way of the seal fitting, and the seal fitting filled with a sealing compound.

(v) The sealing compound shall be approved for the purpose, shall not be affected by the surrounding atmosphere or liquids, and shall not have a melting point of less than 93 degrees C.

(vi) In the completed seal, the minimum thickness of the sealing compound shall be not less than the trade size of the conduit, and in no case less than $\frac{5}{8}$ of an inch.

(vii) Splices and taps shall not be located in the seal-fitting, nor shall other fittings in which splices or taps are made be filled with compound.

(c) *Electrical installations in Class II hazardous locations*—(1) *Switches, circuit breakers, motor controllers, and fuses.* Switches, circuit breakers, motor controllers and fuses, including push-buttons, relays and similar devices, which are intended to interrupt current in the normal performance of the function for which they are installed, or which are installed where dusts of an electrically conducting nature may be present, shall be provided with dust-tight enclosures approved for Class II locations.

(i) Disconnecting and isolating switches containing no fuses and not intended to interrupt current, and which are not installed where dust may be of an electrically conducting nature, shall be provided with tight metal enclosures which shall be equipped with close fitting covers, or with other effective means to prevent the escape of sparks or burning material; and shall have no openings (such as holes for attachment screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of dust or adjacent combustible material might be ignited.

(2) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, and any overcurrent devices or switching mechanisms associated with them, shall have dust-tight enclosures approved for Class II locations.

(3) *Motors and generators.* Motors, generators and other rotating electrical machinery shall be totally enclosed not ventilated, totally enclosed pipe ventilated, or totally enclosed fan-cooled, and shall be approved for Class II locations.

(4) *Appliances, fixed and portable.* Appliances, fixed and portable, including electrically heated and motor-driven appliances, shall be approved for Class II locations.

(5) *Lighting fixtures.* Each lighting fixture, fixed or portable, shall be approved for Class II locations, and shall be clearly marked to indicate the maximum wattage of the lamp for which it is approved. Each fixture shall be protected against mechanical injury by a suitable guard. Pendent fixtures having rigid conduit stems longer than 12 inches shall have permanent and effective bracing against lateral displacement. Boxes, box assemblies or fittings used for the support of lighting fixtures shall be approved for the purpose and for Class II locations.

(6) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall be polarized type providing for connection to the grounding conductor of the flexible cord, and shall be approved for Class II locations.

(7) *Signal, alarm, remote-control, and communication systems.* (i) Switches, circuit breakers, relays, contactors and fuses which may interrupt other than voice currents, and current-breaking contacts for bells, horns, howlers, sirens and other devices in which sparks or arcs may be produced, shall be provided with dust-tight enclosures approved for Class II locations.

(ii) Resistors, transformers, and choke coils which may carry other than voice currents, and rectifiers, thermionic tubes, and other heat generating equipment or apparatus shall be provided with dust-tight enclosures approved for Class II locations.

(8) *Wiring methods*—(i) *Fittings and boxes.* Fittings and boxes shall be provided with threaded bosses for terminal tubes, shall have close fitting covers, and shall have no openings (such as holes for attaching screws) through which sparks or burning material might escape. Fittings or boxes in which taps, joints or terminal connections are made, or which are used in locations where dusts are of an electrically conducting nature, shall be approved for Class II locations.

(ii) *Electric cables.* Electric cables shall be leaded and armored, impervious sheathed and armored, or mineral-insulated metal sheathed. Cable entrances shall be made dust-tight by terminal tubes or, in case of Type MI cable, by fittings designed for that purpose.

(iii) *Flexible connections.* Where necessary to employ flexible connections, dust-tight flexible connectors, flexible metal conduit, or flexible cord approved for extra hard usage and provided with bushed fittings shall be used, except that where dusts are of an electrically-conducting nature, flexible metal conduit shall not be used, and flexible cords shall be provided with dust seals at both ends. Where flexible cords are subject to oil or other corrosive conditions, the conductors shall be of a type approved for the condition. An additional conductor for grounding shall be provided in the flexible cord.

(d) *Electrical installations in Class III hazardous locations*—(1) *Switches circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor

controllers, and fuses, including push buttons, relays, and similar devices, shall be provided with tight metal enclosures which shall be equipped with close fitting covers, or with other effective means to prevent escape of sparks or burning material; and shall have no openings (such as holes for attachment screws) through which after installation, sparks or burning material might escape, or through which exterior accumulations of fibers or flyings or adjacent combustible material might be ignited.

(2) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, shall conform to paragraph (c) (2) of this section.

(3) *Motors and generators.* Motors, generators, and other rotating electrical machinery shall be totally enclosed not ventilated, totally enclosed pipe-ventilated, or totally-enclosed fan-cooled.

(4) *Applicances, fixed and portable.* Appliances, fixed and portable, shall conform to the requirements of this subparagraph.

(i) *Heaters.* Electrically heated appliances shall be provided with dust-tight enclosures and shall be approved for Class III locations.

(ii) *Motors.* Motors of motor-driven appliances shall conform to subparagraph (3) of this paragraph. Appliances which may be readily moved from one location to another shall conform to requirements for the most hazardous location.

(iii) *Switches, circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor controllers and fuses shall conform to paragraph (c) (1) of this section.

(5) *Lighting fixtures.* Lighting fixtures shall conform to the requirements of this subparagraph.

(i) *Construction.* Each fixture shall be of dust-tight type so designed that in the event of burnout of lamp or lampholder, no spark or hot metal can escape from the fixture. Unless each fixture is so constructed that it will not accept a lamp of larger wattage than that for which it is designed, it shall be clearly marked to indicate the maximum wattage of lamp that should be used.

(ii) *Mechanical injury.* A fixture which may be exposed to mechanical injury shall be protected by a suitable guard.

(iii) *Supports.* Boxes, box assemblies or fittings used for the support of lighting fixtures shall be of a type approved for the purpose.

(iv) *Portable lamps.* Portable lamps shall be dust-tight and shall be protected with substantial guards. Lampholders shall be of unswitched type with no exposed metal parts. Unless the portable lamp is so constructed that it will not accept a lamp of larger wattage than that for which it is designed, it shall be clearly marked to indicate the maximum wattage of lamp that should be used.

(6) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall conform to paragraph (c) (6) of this section.

(7) *Signals, alarm, remote control and communication systems.* Signal, alarm, remote-control and communication systems shall conform to paragraph (c) (7) of this section.

(8) *Wiring methods.* (i) Fittings and boxes in which taps, joints, or terminal connections are made shall be provided with close fitting covers, or other effective means, to prevent the escape of sparks or burning material; and shall have no openings (such as holes for attaching screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of fibers or flyings or adjacent combustible materials might be ignited.

(ii) Electric cables shall conform to paragraph (c) (8) (ii) of this section.

(iii) Flexible connections shall conform to paragraph (c) (8) (iii) of this section.

Subpart 111.65—Special Requirements for Certain Locations and Systems

§ 111.65–1 Application.

The requirements of this subpart contain special requirements relative to electrical installations in specific areas and to specific electrical systems. Except as modified by this subpart, all other applicable rules contained in this subchapter shall also apply to such installations and systems.

§ 111.65–5 Special requirements for hospital operating rooms.

(a) *Application.* The requirements of this section are applicable to any area of a hospital in which it is intended to administer to a patient any combustible anesthetic agent in the course of examination or treatment, and to any room used for storage of combustible anesthetic or disinfecting agents.

(b) *General requirements.* The electrical installations and electrical equipment in anesthetizing locations and in storage locations for combustible anesthetic or disinfecting agents shall comply with "Code for Use of Flammable Anesthetics (Safe Practice for Hospital Operating Rooms)" published by National Fire Protection Association. The requirements of "Class I, Group C, Division 1 locations of Article 500 of the National Electrical Code" as referred to in "Code for Use of Flammable Anesthetics (Safe Practice for Hospital Operating Rooms)" shall be be construed to mean the requirements for Class I, Group C locations covered in § 111.60–40(b).

§ 111.65–10 Special requirements for locations where gasoline or other highly volatile motor fuel is carried in vehicles.

(a) *Application.* The provisions of this section are applicable to any area in which gasoline or other highly volatile motor fuel is stored in self-propelled vehicles being transported.

(b) *General requirements.* Electrical equipment which tends to produce arcs or sparks, such as cutouts, switches, receptacles, lampholders, generators, motors, or other equipment having make-or-break or sliding contacts, when installed within 18 inches of the deck, shall be of a type approved for Class I, Group D locations, in accordance with § 111.60–40(b). Electrical equipment installed at or over 18 inches above the deck shall be of the totally-enclosed type or drip-proof protected equipment provided with suitable guards or screens to prevent escape of sparks or hot metal particles.

(1) The reference to a level of 18 inches above the deck shall be construed to mean each deck at or above the weather deck on which vehicles are transported.

(2) Areas below the weather deck on which vehicles are transported shall be deemed to be a hazardous area to a height 18 inches above the weather deck. Where continuous pressure-positive ventilation of areas below the weather deck on which vehicles are transported is provided, the hazardous area may be deemed to extend only up to a height of 18 inches above the deck in each such area: *Provided,* That all the following conditions are complied with:

(i) The quantity of ventilating air shall be not less than 1 cubic foot per minute per square foot of deck area.

(ii) The ventilation system shall be such as to prevent air stratification as well as to prevent the accumulation of air pockets.

(iii) An alarm system shall be provided to indicate in the wheelhouse the loss of the required ventilation.

§ 111.65–15 Special requirements for motion picture projection rooms and projection equipment.

(a) *General*—(1) *Professional type projectors.* The professional type of projectors shall be located in a projector room. Such rooms shall not be considered as a hazardous location as defined in § 111.60–40. (The professional projector employs a 35-millimeter film which is 1⅜ inches wide and has on each edge 5.4 perforations per inch.)

(2) *Non-professional type projectors.* Projectors of the non-professional or miniature type, if employing only approved slow-burning (cellulose acetate or equivalent) film, may be operated without a projection room.

(b) *Equipment and projectors of the professional type*—(1) *Motor-driven projectors.* Motor-driven projectors shall be approved for the purpose as an assembly or shall comply with all the conditions contained in this subparagraph.

(i) An approved projector shall be used.

(ii) An approved projector lamp shall be used.

(iii) Motors shall be so designed or guarded as to prevent ignition of film by sparks or arcs.

(iv) Projectors shall be under the charge of a qualified person.

(2) *Conductor size.* Conductors supplying outlets for projectors of the professional type shall not be smaller than No. 8 AWG, and shall be of sufficient size for the projector employed.

(3) *Conductor insulation.* Conductors having a maximum operating temperature of 200 degrees C. shall be used on all lamps or other equipment when the ambient temperature at the conductors as installed will exceed 50 degrees C.

(4) *Flexible cords.* Cords approved for hard service shall be used on portable equipment.

(5) *Lamp guards.* Incandescent lamps in projector rooms shall be provided with guards unless otherwise protected by noncombustible shades or other enclosures.

(6) *Location of equipment.* Motor-generator sets, transformers, rectifiers, rheostats, and similar equipment for the supply or control of current to arc lamps on projectors shall, if practicable, be located in separate rooms. If placed in the projector room, they shall be so located or guarded that arcs or sparks cannot come in contact with film. Motor-generator sets shall have the commutator end or ends totally enclosed.

(7) *Equipment prohibited.* No switches, overcurrent devices, or other equipment, not normally required or used for projectors, sound reproduction, flood, or other special effect lamps or other equipment, shall be installed in projector rooms, except remote-control switches for control of auditorium lights.

(c) *Construction of equipment and projectors of the professional type.* (1) Projectors and enclosures for arc or incandescent lamps and associated equipment shall be of a type, listed as approved by Underwriters' Laboratories, Inc.

§ 111.65–20 Special requirements for electric elevators and dumbwaiters.

(a) *Application.* The requirements of this section are applicable to electric elevators and dumbwaiters.

(b) *General requirements.* The electrical control and interlock circuits of elevators and dumbwaiters shall be in accordance with American Standards Association Safety Code for Elevators, Dumbwaiters, and Escalators. The construction of control switches shall conform with the requirements of Underwriters' Laboratories, Inc. Standard for Elevator Electric Contacts and Elevator Hoistway Door Interlocks.

§ 111.65–25 Special requirements for submersible motor-driven bilge pumps.

(a) *Application.* The requirements of this section are applicable to submersible motor-driven bilge pumps required on certain vessels by Subpart 55.10 of Subchapter F (Marine Engineering) of this chapter.

(b) *General requirements.* (1) The electric motor driving the submersible bilge pump shall be installed in an open end air bell of rugged construction and of such proportions that flooding of the compartment, in which it is located to the bulkhead deck will not cause water to enter the motor.

(2) The motor may be of the open type provided it is protected against splashing water from the bottom.

(3) Cables to the motor shall enter through the open bottom of the air bell.

(4) The motor shall be capable of continuous operation at rated load under any condition, dry or with water in air bell at any level up to maximum.

(5) The motor controller shall be located above the bulkhead deck with a master switch at the controller and a master switch at the motor. The master switch at the motor shall be connected in such a manner that it will be completely disconnected from the circuit when the motor is started or stopped from the remote master switch.

(6) The motor shall be energized from the final source of emergency lighting and power.

§ 111.65–30 Special requirements for electric power-operated watertight door system.

(a) *Application.* The provisions of this section are applicable to electric power-operated watertight door systems required by Subpart 73.35 of Subchapter H (Passenger Vessels) of this chapter, except that only paragraph (g) of this section shall be applicable to installations contracted for prior to November 19, 1952.

(b) *General requirements.* The watertight door operating system shall comply with the specification requirements of Subpart 163.001 of Subchapter Q (Specifications) of this chapter.

(c) *Power supply.* The power supply to power operated watertight door systems shall comply with the requirements contained in this paragraph.

(1) The source of power for electric motor-driven door operators shall be the source of the emergency lighting and power system as required by Subpart 112.15 of this chapter.

(2) If the peak current resulting from the simultaneous starting of all doors is too great for the temporary or final source of supply, the control shall be so arranged that when the central master switch is put to "close" the doors will start to close serially at intervals of not more than 3 seconds, preference being given to the doors starting with those in the lowest part of the vessel. The total time for all doors to be closed shall not exceed 60 seconds.

(3) The power supply for hydraulically operated watertight door systems employing a hydraulic system common to more than one watertight door shall be an accumulator tank of sufficient capacity to open all doors twice and to close all doors three times and one or more motor-driven hydraulic pumps capable of being operated from the final source of the emergency lighting and power system.

(i) The motor-driven hydraulic pumps automatically shall maintain the accumulator tank pressure within the design limits, and shall be located and controlled from above the bulkhead deck.

(ii) The accumulator tank capacity required by subdivision (i) of this subparagraph shall be available when the accumulator tank pressure is at the automatic pump "cut-in" pressure.

(4) The source of power for hydraulically operated watertight door systems employing an independent hydraulic system for each door operator shall be as required by subparagraphs (1) and (2) of this paragraph.

(5) The power supply for other types of watertight door operators shall be as approved by the Commandant.

(d) *Distribution.* Distribution of electric power to the watertight door operators shall comply with the requirements covered in this paragraph.

(1) Distribution panelboards used in connection with watertight door systems shall be located above the bulkhead deck and shall be provided with means for locking to prevent unauthorized access to the switching devices or fuses.

(2) Feeders supplying several watertight door operators shall be located above the bulkhead deck.

(3) A separate branch circuit shall be provided for each watertight door operator.

(e) *Overcurrent protection.* Overcurrent devices employed in watertight door system feeders and branch circuits shall be arranged to isolate a fault with as little disruption of the system as possible. The relationship between loads and rating or setting of overcurrent devices shall conform to the requirements covered in this paragraph.

(1) The rating or setting of each feeder overcurrent device shall be not less than 200 percent of its maximum load.

(2) The rating or setting of a branch circuit overcurrent device shall be not more than 25 percent of that of the feeder overcurrent device.

(f) *Cable.* All cable used in connection with watertight door system feeder circuits or branch circuits shall be leaded and armored, impervious sheathed and armored, or mineral-insulated, metal sheathed.

(g) *Existing vessels.* (1) Existing arrangements, materials, and facilities previously approved but not meeting the applicable specifications or requirements set forth in paragraphs (b) through (f) of this section may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation provided that in no case will a greater departure from the standards of paragraphs (b) through (f) of this section be permitted than presently exist.

(2) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65–35 Special requirements for fire screen door holding and release systems.

(a) *Application.* When an electric fire screen door holding and release system is installed in compliance with the requirements of Part 72 of Subchapter H (Passenger Vessels) of this chapter, the provisions of this section, with the exception of paragraph (e) of this section shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of paragraph (e) of this section.

(b) *Definitions.* (1) The term "fire screen door" will be used in this section to designate any self-closing door required to comply with § 72.05–25 (b) of Subchapter H (Passenger Vessels) of this chapter.

(2) The term "fire screen holding device" will be used in this section to designate any device designed and installed for the purpose of holding open a fire screen door.

(3) The term "local control station" will be used in this section to designate any manually operated device installed adjacent to a fire screen door for the purpose of releasing the door so that the fire screen door self-closing mechanism may close the door.

(4) The term "central control station" will be used in this subpart to designate any manually operated device installed to release the fire screen doors from the wheelhouse or fire control room.

(c) *General.* (1) The fire screen door holding and release system requirements contained in this section presuppose that the fire screen doors will be held open by electromagnets, door release being effected by deenergizing the electromagnets.

(2) The Commandant may accept any other means for fire screen door holding and releasing not less effective than the electromagnetic type covered by this subpart.

(d) *General requirements.* (1) The fire screen door holding and release system shall consist of an electromagnet for each fire screen door, a self-aligning armature plate on each door to be seized and held by the electromagnet when the fire screen door is fully open, a control switch located adjacent to the door to interrupt the supply potential to the electromagnet, and a central control located in the wheelhouse or fire control room to interrupt remotely potential to all holding magnets.

(2) The fire screen door holding circuit shall be arranged so that loss of potential from any cause will release the doors, except that momentary interruptions of the circuit that may result from the operation of automatic bus-transfer devices in connection with the emergency lighting and power system, will not release the doors.

(3) The central control station shall consist of an enclosed switch, circuit breaker, or magnetic contactor of ample rating to interrupt the connected load. The switching unit shall be externally operative and maintaining in both the "hold doors" and "release doors" positions.

(4) The local control station shall consist of an enclosed externally operative fused switch having a rating of not less than 10–T amperes, 125 volts, and may be either the momentary contact type or the maintaining contact type. A single door holding magnet shall be connected to the fuse end of this local control station. Where several doors are in close proximity to each other, a single local control station switch of ample rating may be used to release simultaneously these several doors.

(5) A door holding electromagnet shall be designed for a nominal pull of approximately 200 pounds. When the arrangement of the electrical supply involves transfer relays to transfer the supply from a normal to a temporary source, a door holding electromagnet shall be designed so that, with a pull on the armature of 110 pounds, the armature will be held in the sealed position for approximately ¼ second after the circuit to the electromagnet is opened. The electromagnet shall be designed for continuous duty in an ambient temperature of 50 degrees C. with a temperature rise by thermometer measurement of not more than 55 degrees C. for Class A insulation nor more than 75 degrees C. for Class B insulation. The electromagnet coil shall be vacuum impregnated and the magnet enclosure shall be either drip-proof or watertight.

(6) The source of power for the fire screen door holding and release system shall be the emergency lighting and power system as required by Subpart 112.15 of this subchapter.

(7) On large vessels where the closing of all fire screen doors simultaneously would seriously interfere with fire-fighting operations or with the evacuation of passengers, it is recommended that the fire screen door release system be subdivided into several circuits. The circuits shall be arranged so that it will be possible to isolate any compartment in which a fire is reported by a sufficient number of closed fire screen doors effectively to stop all draft to the fire area. An effective draft stop will entail closing:

(i) All fire screen doors in the area between the main vertical zone bulkheads immediately forward and aft of the fire area;

(ii) All fire screen doors in the main vertical zone bulkheads immediately forward and aft of the fire area; and,

(iii) All fire screen doors in the next adjacent main vertical zones, forward and aft of the fire area. The fire screen door tripping arrangement shall be specifically approved for each vessel.

(e) *Existing vessels.* Fire screen door holding and release systems on vessels contracted for prior to November 19, 1952, shall meet the requirements covered in this paragraph.

(1) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(2) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65–40 Special requirements of electric power-operated lifeboat winches.

(a) *Application.* The provisions of this section, with the exception of paragraph (i) of this section, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of paragraph (i) of this section, shall apply to all vessels contracted for prior to November 19, 1952.

(b) *General.* The provisions of this section supplement the requirements of Subpart 160.015 of Subchapter Q (Specifications), Part 33 of Subchapter D (Tank Vessels), Part 75 of Subchapter H (Passenger Vessels) and Part 94 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(c) *General construction requirements.* (1) Control and power circuit switches and motor controllers installed in conjunction with lifeboat winches shall be of types specifically approved for use with lifeboat winches.

(2) Switches and motor controllers shall be of a design not likely to be adversely affected by corrosion of the working parts. Particular attention shall be given to hinged parts of contactors and relays. Structural parts, such as the enclosing cases, if not constructed of corrosion-resistant materials, shall be given a durable corrosion-resistant finish.

(3) Insulating materials shall be limited to those which exhibit the lowest relative water absorption and/or the least effect of such water absorption upon the dielectric properties consistent with the other necessary characteristics.

(4) Where gaskets are used to provide a water seal between parts of an assembly, the gasket shall be secured in place in such a manner as to prevent its falling out or becoming loose when the unit is disassembled.

(5) Holes in the walls of equipment housings for the purpose of providing means for the attachment of parts on the interior thereof, or for securing covers and the like, shall not penetrate the total thickness of the housing wall.

(6) Totally enclosed units shall be provided with a needle valve or with at least one hole closed by a ¼ inch pipe plug for draining condensed moisture. The valve or hole shall be located at the bottom, or as near the bottom as practicable, of the enclosure in order that it may drain the enclosure satisfactorily.

(7) Main line emergency disconnect switches, when installed in a location accessible to passengers, shall be provided with means whereby the switch can be locked in the open-circuit position by means of a padlock or the equivalent. The switch shall have no provisions for locking in the closed-circuit position.

(d) *Detail construction requirements*—(1) *Enclosures.* Each enclosure for motor controller and switching de-

vices, when installed in locations exposed to the weather, shall be capable of meeting the test requirements of paragraph (e) of this section.

(2) *Electrical clearances.* The minimum creepage and air clearance distance between live parts of different polarity of motor controllers, master switches, and control circuit limit switches shall be not less than the values shown in Table 111.65–40 (d) (2). It is desirable to exceed these values where possible. The electrical clearances for power circuit limit switches and main line emergency disconnect switches shall be not less than the general requirements for such devices given in this part.

(3) *Motors.* Motors shall be of watertight construction in accordance with the general requirements of this part.

TABLE 111.65–40 (d) (2)—MINIMUM SPACINGS IN INCHES

Potential involved in volts	0–150	151–[illegible]	301–[illegible]
Between any uninsulated live part and an uninsulated live part of opposite polarity, an uninsulated grounded part other than the enclosure, or an exposed metalpart.	Through air ¼ Over surface ½	5/16 ⅝	⅜ ¾
Between any uninsulated live part and the walls of a metal enclosure, including fittings for cable entrance.	Through air ½ Over surface ¾	½ ¾	½ ¾

(e) *Spraytight test.* (1) Before conducting this test, all joints that have gaskets or sealing compounds, or that have been painted, shall be broken and reassembled three times; this procedure also applies to doors and to cover plates. There shall be no leakage of water into the enclosure after it has been subjected to one of the following methods of submergence for a period of five continuous minutes:

(i) The enclosure shall be submerged in water to such a depth that the highest point of the enclosure in its normally mounted position is under a three-foot head; or

(ii) The enclosure shall be submerged in water at least 3 inches at the highest point in an open tank. Sufficient vacuum shall then be applied to the inside of the enclosure to produce an external pressure equivalent to a 3-foot head of water.

(2) The following additional test shall be conducted immediately after either of the above tests, and while the enclosure is still submerged. An internal air pressure shall be applied for a period of 5 minutes equal to 1½ pounds per square inch, plus a pressure equivalent to the depth of submergence.

(3) Under these tests the enclosure will be considered spraytight if no water is found inside the enclosure, and if no air bubbles are seen to emerge. Where a shaft enters the enclosure, the shaft shall be operated twice while submerged.

(4) The following formula may be used to determine the necessary vacuum:

$$M = 0.074\ (12H - W) \qquad (1)$$

where:

M = vacuum in inches of mercury,
H = equivalent head of water in feet, and
W = depth of water in inches covering the highest point of the enclosure.

(f) *Wiring of lifeboat winch components.* (1) When the motor controller of a lifeboat winch power unit is located adjacent to the winch, the main line emergency switch shall disconnect all parts of the lifeboat winch power unit, including the motor controller and limit switches, from all sources of potential. Any other power circuit switches employed shall be connected in series with the main line emergency switch and ahead of the motor controller. The main line emergency switch shall serve as the motor and controller disconnect required by the general requirements of this part, and shall have a horsepower rating not less than that of the winch motor.

(2) When the motor controller of a lifeboat winch power unit is remotely located with relation to the winch, a switch shall be provided at the controller arranged to disconnect the entire winch electrical installation from all sources of potential. In such cases, the main line emergency switch shall be connected in series with this circuit disconnect switch and ahead of the power circuit limit switches, when employed, and ahead of the motor controller.

(3) Davit arm limit switches, whether connected in the power circuit or in the control circuit, shall disconnect all ungrounded conductors of the circuit controlled.

(4) Where one motor is used with two winches, a main line emergency switch, a clutch interlock switch, and a master switch shall be provided for each winch, except that a single main line emergency switch located in accordance with subparagraph (5) of this paragraph with respect to both winches will be accepted. The main line emergency switches shall be connected in series ahead of the motor controller. The master switches shall be connected in parallel and each in series with the corresponding clutch interlock switch for that winch. The clutch interlock switches shall open the circuit to its master switch except when the power unit is clutched to the associated winch. Means shall be provided to prevent the power unit from being clutched to both winches simultaneously.

(5) Typical lifeboat winch wiring diagrams and arrangement drawings are shown on Figures 111.65–40 (f) (5) (i) through 111.65–40 (f) (5) (iv), the arrangement of the equipment shown being diagrammatical. The fact that some show direct current motors and some show alternating current motors has no particular significance. In actual installations the main line emergency disconnect switch shall be so located as to be adjacent to the master switch; within reach of the winch operator; in a position accessible to the person in charge of the boat stowage; and in a position, for gravity davit installations, from which the movement of both davit arms can be observed as they approach the final stowed position. Special consideration will be given to other arrangements where complete compliance with these location requirements cannot be met.

(g) *Procedure for approval of lifeboat winch electrical installations and equipment*—(1) *Switches.* Manufacturers of master switches, limit switches, and main line emergency disconnect switches desiring to qualify their products for use in connection with lifeboat winch installations shall submit for review detail assembly drawings of the unit, identifying each part used in the assembly and the material specification, including finish, if any, of each part. After the detail assembly drawings have been reviewed sample units may be requested for testing. Units found to comply with the requirements of this section will be listed by the Coast Guard as being satisfactory for use as lifeboat winch auxiliary equipment.

(2) *Motor controllers.* Manufacturers of motor controllers desiring to qualify their products for use in conjunction with lifeboat winch installations shall submit for review detail assembly drawings and material lists of the enclosing cases to be furnished, and detail assembly drawings and material lists and/or samples of contactors, relays, resistors and other motor controller components to be employed. For each installation of lifeboat winch motor controllers there shall be submitted for approval a drawing showing the enclosure outline, front view assembly, wiring diagram, and material list, together with the name or other identification of the vessel on which the motor controllers will be installed. No general approval of motor controllers will be given.

(3) *Motors.* For each installation of lifeboat winch motors, plans as required by § 111.05–5 shall be submitted, together with the name or other identification of the vessel on which the motor will be installed. No general approval of motors will be given.

(4) *Shipboard installation drawing.* For each shipboard installation of electric power-operated lifeboat winches, an elementary wiring diagram and isometric or deck wiring diagram as required by § 111.05–5 shall be submitted.

(h) *Testing of lifeboat winch electrical equipment.* The electrical equipment shall be given periodic inspections and tests as required by Part 78 of Subchapter H (Passenger Vessels) and Part 97 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(i) *Electric power-operated lifeboat winches for existing vessels.* (1) The electrical equipment installed in connection with electric power-operated lifeboat winches used with gravity davits on passenger vessels and cargo vessels contracted for prior to November 19, 1952, and on tank vessels contracted for on or after November 19, 1952 shall comply with the requirements of § 160.015–3(k) of Subchapter Q (Specifications) of this chapter and with the wiring arrangements of § 111.65–40(f).

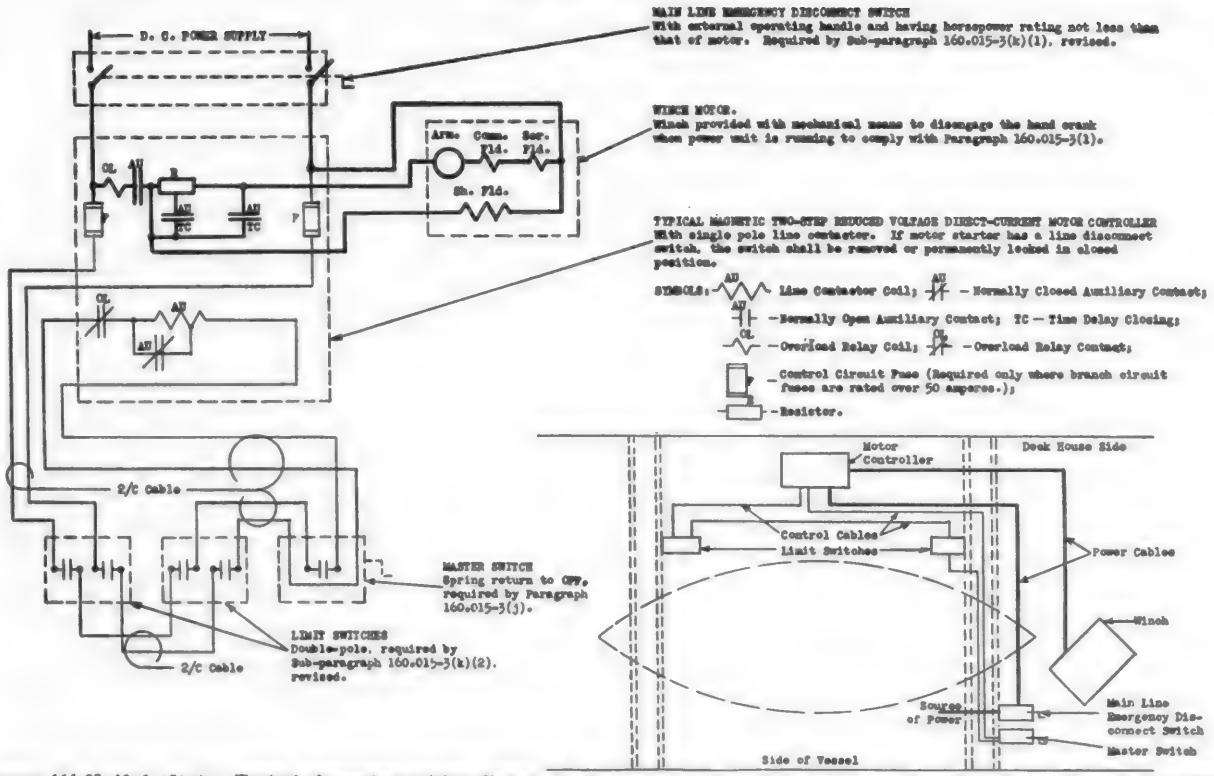
MAIN LINE EMERGENCY DISCONNECT SWITCH
With external operating handle and having horsepower rating not less than that of motor. Required by Sub-paragraph 160.015-3(k)(1), revised.
D. C. POWER SUPPLY
WINCH MOTOR.
Winch provided with mechanical means to disengage the hand crank when power unit is running to comply with Paragraph 160.015-3(1).
Arm. Comm. Ser. Fld. Fld.
Sh. Fld.
TYPICAL MAGNETIC TWO-STEP REDUCED VOLTAGE DIRECT-CURRENT MOTOR CONTROLLER
With single pole line contactor. If motor starter has a line disconnect switch, the switch shall be removed or permanently locked in closed position.
SYMBOLS: Line Contactor Coil; - Normally Closed Auxiliary Contact;
- Normally Open Auxiliary Contact; TC - Time Delay Closing;
- Overload Relay Coil; - Overload Relay Contact;
- Control Circuit Fuse (Required only where branch circuit fuses are rated over 50 amperes.);
- Resistor.
2/C Cable
MASTER SWITCH
Spring return to OFF, required by Paragraph 160.015-3(j).
LIMIT SWITCHES
Double-pole, required by Sub-paragraph 160.015-3(k)(2), revised.
2/C Cable
Motor Controller
Deck House Side
Control Cables
Limit Switches
Power Cables
Winch
Source of Power
Main Line Emergency Disconnect Switch
Master Switch
Side of Vessel

FIGURE 111.65-40(f)(5)(i)—Typical elementary wiring diagram and arrangement plan of gravity davit and boat winch employing double-pole limit switches and main line emergency switch in accordance with Subpart 160.015, Subchapter Q.

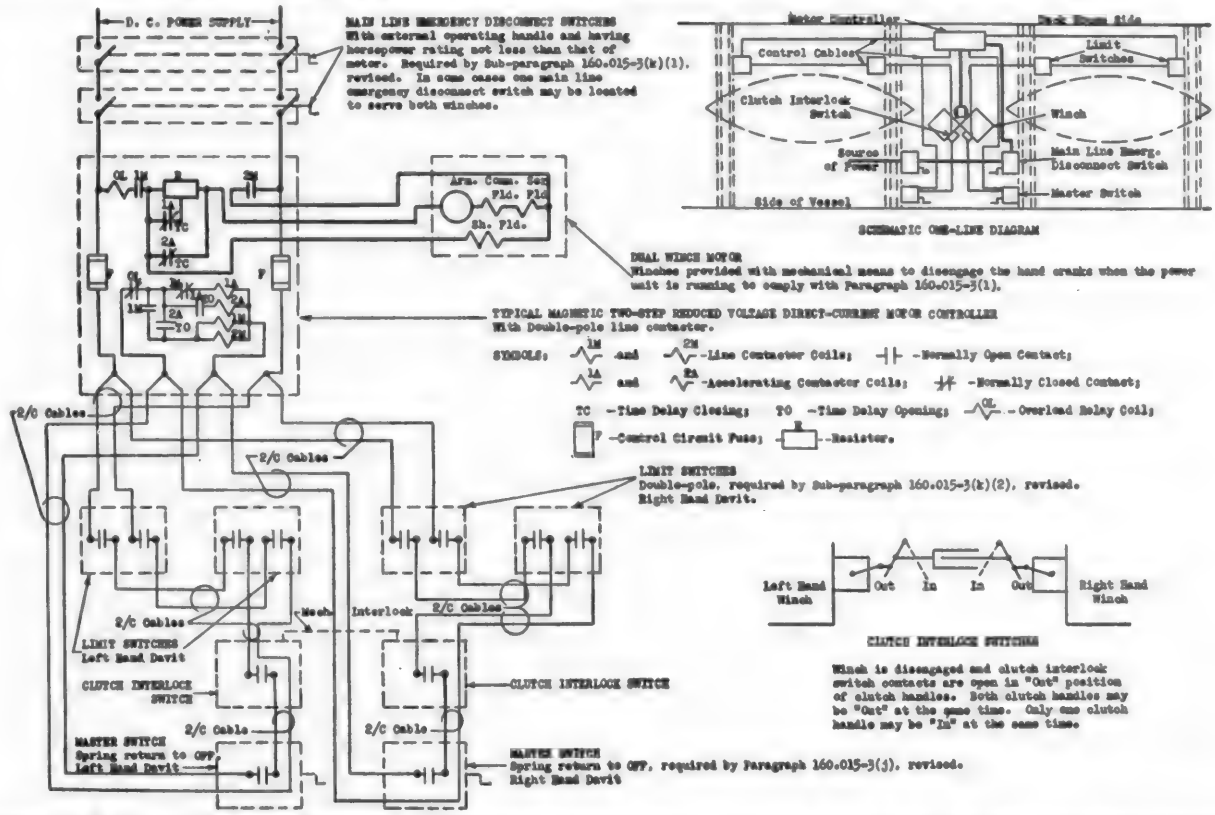
D. C. POWER SUPPLY
MAIN LINE EMERGENCY DISCONNECT SWITCHES
With external operating handle and having horsepower rating not less than that of motor. Required by Sub-paragraph 160.015-3(k)(1), revised. In some cases one main line emergency disconnect switch may be located to serve both winches.
Motor Controller
Deck House Side
Control Cables
Limit Switches
Clutch Interlock Switch
Winch
Source of Power
Main Line Emerg. Disconnect Switch
Master Switch
Side of Vessel
SCHEMATIC ONE-LINE DIAGRAM
Arm. Comm. Ser. Fld. Fld.
Sh. Fld.
DUAL WINCH MOTOR
Winches provided with mechanical means to disengage the hand cranks when the power unit is running to comply with Paragraph 160.015-3(1).
TYPICAL MAGNETIC TWO-STEP REDUCED VOLTAGE DIRECT-CURRENT MOTOR CONTROLLER
With Double-pole line contactor.
SYMBOLS: 1M and 2M -Line Contactor Coils; -Normally Open Contact;
1A and 2A -Accelerating Contactor Coils; -Normally Closed Contact;
TC -Time Delay Closing; TO -Time Delay Opening; -Overload Relay Coil;
-Control Circuit Fuse; -Resistor.
2/C Cables
2/C Cables
LIMIT SWITCHES
Double-pole, required by Sub-paragraph 160.015-3(k)(2), revised.
Right Hand Davit.
Left Hand Winch
Out
In
In
Out
Right Hand Winch
CLUTCH INTERLOCK SWITCHES
Winch is disengaged and clutch interlock switch contacts are open in "Out" position of clutch handles. Both clutch handles may be "Out" at the same time. Only one clutch handle may be "In" at the same time.
2/C Cables
Mech. Interlock
2/C Cables
LIMIT SWITCHES
Left Hand Davit
CLUTCH INTERLOCK SWITCH
CLUTCH INTERLOCK SWITCH
2/C Cable
2/C Cable
MASTER SWITCH
Spring return to OFF, Left Hand Davit
MASTER SWITCH
Spring return to OFF, required by Paragraph 160.015-3(j), revised.
Right Hand Davit

FIGURE 111.65-40(f)(5)(ii)—Typical elementary wiring diagram and arrangement plan of gravity davits and dual boat winch employing double-pole limit switches, clutch interlock switches, and main line emergency switches in accordance with Subpart 160.015, Subchapter Q.

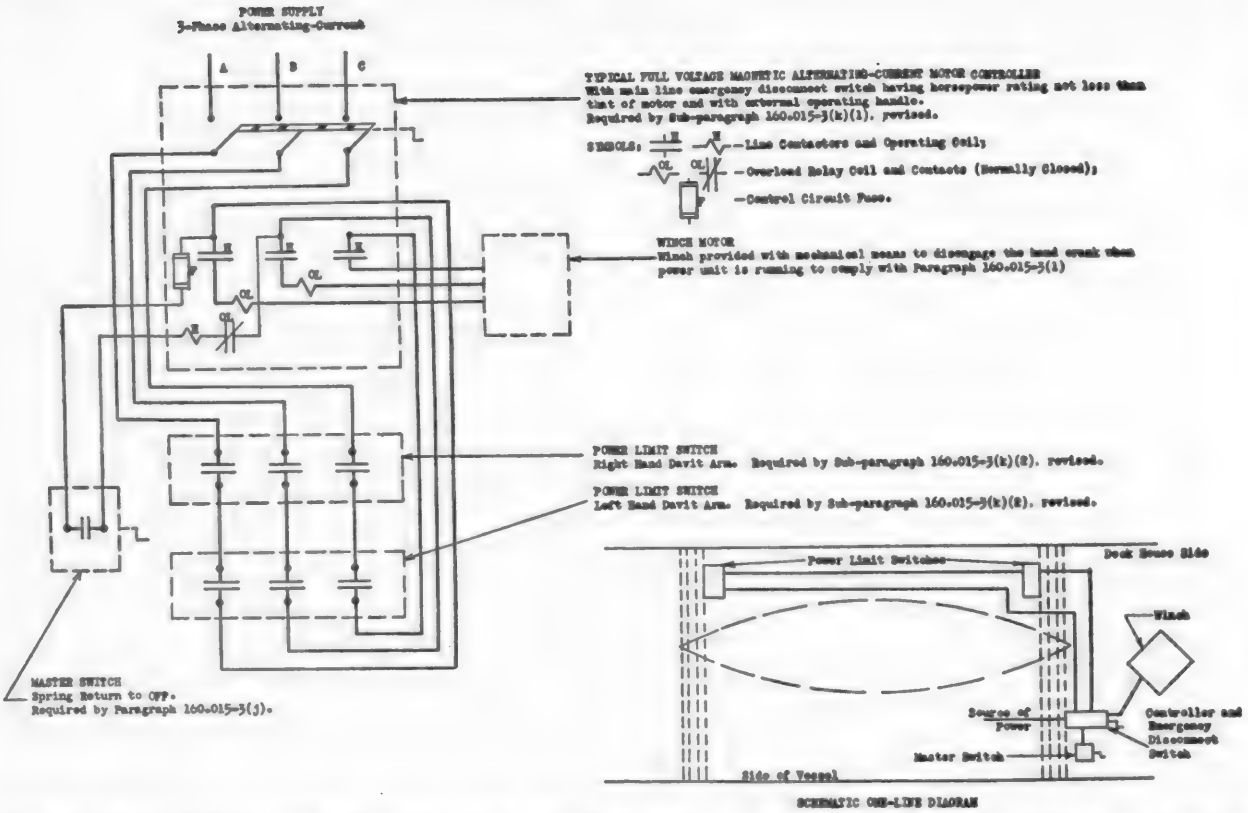
POWER SUPPLY
3-Phase Alternating-Current
A
B
C
TYPICAL FULL VOLTAGE MAGNETIC ALTERNATING-CURRENT MOTOR CONTROLLER
With main line emergency disconnect switch having horsepower rating not less than that of motor and with external operating handle.
Required by Sub-paragraph 160.015-3(k)(1), revised.
SYMBOLS:
—Line Contactors and Operating Coil;
—Overload Relay Coil and Contacts (Normally Closed);
—Control Circuit Fuse.
WINCH MOTOR
Winch provided with mechanical means to disengage the hand crank when power unit is running to comply with Paragraph 160.015-3(i)
POWER LIMIT SWITCH
Right Hand Davit Arm. Required by Sub-paragraph 160.015-3(k)(2), revised.
POWER LIMIT SWITCH
Left Hand Davit Arm. Required by Sub-paragraph 160.015-3(k)(2), revised.
MASTER SWITCH
Spring Return to OFF.
Required by Paragraph 160.015-3(j).
Power Limit Switches
Deck House Side
Winch
Source of Power
Controller and Emergency Disconnect Switch
Master Switch
Side of Vessel
SCHEMATIC ONE-LINE DIAGRAM

FIGURE 111.65-40(f)(5)(iii)—Typical elementary wiring diagram and arrangement plan of gravity davit and boat winch employing power limit switches and combined starter and main line emergency disconnect switches in accordance with Subpart 160.015, Subchapter Q.

(2) New materials installed to effect compliance with this paragraph shall comply with the applicable requirements of this section. Existing materials continued in service shall comply with the requirements of this section insofar as it is reasonable and practicable.

(3) Modification of existing lifeboat winch electrical installations to effect compliance with this paragraph shall be completed not later than October 1, 1952.

(4) The electrical equipment installed in connection with electric power-operated lifeboat winches used with other than gravity davits on vessels contracted for prior to November 19, 1952, previously approved, but not meeting the applicable specifications or requirements set forth in paragraphs (b) through (f) of this section may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of paragraphs (b) through (f) of this section be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65-45 Special requirements for electric air heaters.

(a) *Application.* (1) The provisions of this section, with the exception of paragraph (c) of this section, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of paragraph (c) of this section shall apply to all vessels contracted for prior to November 19, 1952.

(2) The provisions of this section are applicable to electrically energized units or panels to be employed in heating a room or compartment for the comfort of the occupants thereof. The provisions of this section are not applicable to electrically energized units employed to heat the air in enclosed apparatus, such as motors, controllers, or the like.

(b) *General requirements.* (1) Electric heaters shall be so constructed that the risk of fire is reduced to a minimum. Unspecified construction and circuit details shall be in accordance with Underwriters' Laboratories, Inc., Standard for Electric Space-Heating Equipment.

(2) Heaters shall be designed to heat the surrounding air principally by convection. Heater elements shall be of the enclosed type. The heater element case or jacket should be of a corrosion-resistant material.

(3) Heaters shall be provided with a thermal cutout of the manually reset type that will prevent overheating and with a suitable regulating switch.

(4) Heaters for bulkhead mounting shall have their top slanted or otherwise designed to prevent hanging towels, etc., on the heater. When heaters are of the portable type, an acceptable clip or bracket shall be fitted to hold the heater in a fixed position.

(5) The external temperature of the heater enclosing case shall not exceed a temperature of 125 degrees C., except that the external temperature of the enclosing case of flush mounted heaters shall not exceed a temperature of 100 degrees C. When heaters are mounted upon, or adjacent to, the deck or bulkhead, the construction of the heater shall be such that the nearest deck or bulkhead surface will not exceed a temperature of 55 degrees C. For test purposes an ambient temperature of 25 degrees C. will be used.

(c) *Electric air heaters on vessels contracted for prior to November 19, 1952.* (1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

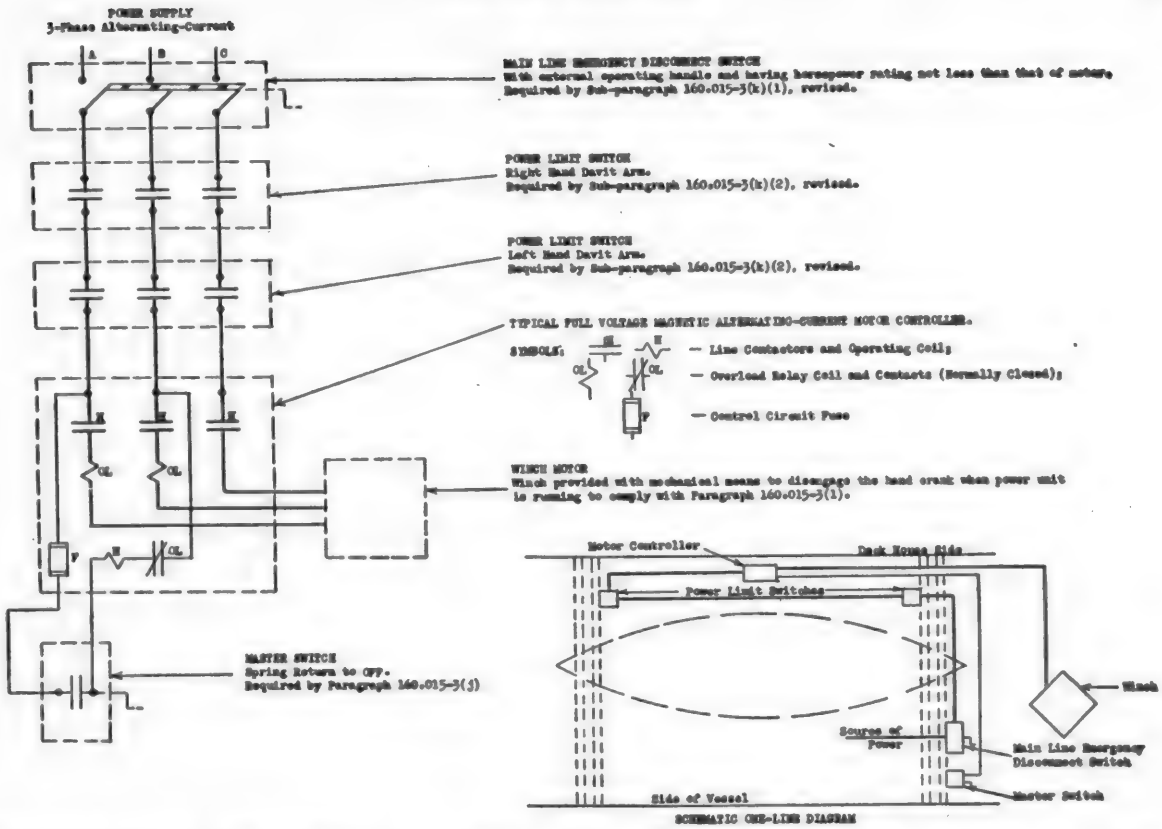
POWER SUPPLY
3-Phase Alternating-Current
A
B
C
MAIN LINE EMERGENCY DISCONNECT SWITCH
With external operating handle and having horsepower rating not less than that of motor.
Required by Sub-paragraph 160.015-3(k)(1), revised.
POWER LIMIT SWITCH
Right Hand Davit Arm.
Required by Sub-paragraph 160.015-3(k)(2), revised.
POWER LIMIT SWITCH
Left Hand Davit Arm.
Required by Sub-paragraph 160.015-3(k)(2), revised.
TYPICAL FULL VOLTAGE MAGNETIC ALTERNATING-CURRENT MOTOR CONTROLLER.
SYMBOLS:
— Line Contactors and Operating Coil;
— Overload Relay Coil and Contacts (Normally Closed);
— Control Circuit Fuse
WINCH MOTOR
Winch provided with mechanical means to disengage the hand crank when power unit is running to comply with Paragraph 160.015-3(1).
MASTER SWITCH
Spring Return to OFF.
Required by Paragraph 160.015-3(j)
Motor Controller
Deck House Side
Power Limit Switches
Winch
Source of Power
Main Line Emergency Disconnect Switch
Motor Switch
Side of Vessel
SCHEMATIC ONE-LINE DIAGRAM

FIGURE 111.65-40(f)(5)(iv)—Typical elementary wiring diagram and arrangement plan of gravity davit and boat winch employing main line emergency switch and power limit switches in accordance with Subpart 160.015, Subchapter Q.

(2) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65-50 Special requirements for electric cooking equipment and motor-driven commissary equipment.

(a) *Application.* The provisions of this section, with the exception of paragraph (d) of this section, shall apply to all vessels contracted for on or after November 19, 1956. The provisions of paragraph (d) of this section shall apply to all vessels contracted for prior to November 19, 1956.

(b) *Electric cooking equipment requirements.* (1) All equipment, attachments and devices shall be of rugged construction and so designed as to permit complete cleaning, maintenance and repair with ease.

(2) Doors shall be provided with heavy duty hinges and locking devices to prevent accidental opening in a heavy sea.

(3) Where necessary for safety of personnel, grab rails shall be provided. Ranges shall be provided with sea rails with adjustable barriers to resist accidental cook pot movement.

(4) Means shall be provided to effect positive grease or fat collection and to prevent spillage thereof onto the deck.

(5) All equipment shall be mounted to prevent dislodgment by roll and/or pitch, whether arranged for fixed wiring or for portable wiring.

(6) Each equipment unit shall be provided with means for disconnecting it from all circuit conductors. The disconnecting means shall plainly indicate whether it is in the open or closed circuit position and shall be located in the same compartment with, and within sight of, its associated equipment. The disconnecting means may be an integral part of the equipment provided this device remains unaffected by the heat of the equipment of which it is a part.

(7) Unspecified construction and circuit details shall be in accordance with Underwriters' Laboratories, Inc., Standard for Commercial Electric Cooking Appliances.

(c) *Motor-driven commissary equipment requirements.* (1) All equipment shall be rigidly constructed and self-supporting, and shall be securely mounted whether arranged for fixed wiring or for portable wiring unless such mounting would defeat the utility of the equipment.

(2) The enclosures of motors and controls shall be either watertight or totally enclosed or comparable protection provided.

(d) *Electric cooking equipment and motor-driven commissary equipment on vessels contracted for prior to November 19, 1956.* (1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(2) All new installations or major replacements shall meet the applicable requirements for vessels contracted for on or after November 19, 1956.

§ 111.65-55 Special requirements for electrical steering gears.

(a) *General.* This section contains requirements for steering gear installations where the main or both the main and auxiliary steering means is electric power driven and where the steering control means is electric powered. Where two steering gear power motors and two separate and independent means for controlling the rudder from the pilothouse are provided, there will be two steering systems, each consisting of a power motor, control system, and steering gear feeder. In general these two systems are to be separate on a port and starboard basis. For any different arrangement of the steering gear system, special consideration and approval will be required with the intent of obtaining a steering installation which will be equivalent to the one covered in this section.

(b) *Disconnecting and switching means.* (1) The steering gear power motors and control systems shall be connected to the respective steering gear branch circuits in the steering gear room. Separate means shall be provided in the steering gear room for disconnecting the motor and control systems from the power source.

(2) If a means of transfer is provided in the steering gear room so arranged that either steering gear power motor and associated control system can be connected to either of the two steering gear branch circuits, interlocks shall be provided to prevent both steering systems from being connected to the same branch circuit simultaneously.

(c) *Control of steering gear motors and steering control systems.* (1) Means shall be provided in the steering gear room for starting and stopping the steering gear power motors and any motors that are part of the pilothouse control system.

(2) Where two separate and independent steering control systems are installed, the means of switching shall be provided in the pilothouse to select the steering control system which is to be used for steering. This selection shall be accomplished by one operating handle but the switches for each system shall be in separate enclosures or shall be separated by suitable fire-resistant barriers. The handle shall have positions for "port control", "off", and "starboard control" with such an arrangement to necessitate the passing through the "off" position when transferring from one steering system to the other.

(3) The selecting means in the pilothouse shall be so arranged that the steering gear power motor for the steering system selected will automatically be started if not already running. Any ancillary device necessary to activate the selected remote means for controlling the rudder shall be automatically operated upon starting the steering gear power motor.

(d) *Overcurrent protection for steering systems.* (1) Short circuit protection only shall be provided for the control circuits of controllers of steering gear power motors and motors used for control systems. This protection shall be instantaneous and rated at 400–500 percent of the current-carrying capacity of the conductors.

(2) Indicating and alarm circuits associated with steering installations shall be provided with overcurrent protection in accordance with § 111.45–10(b)(2). Pilothouse steering control systems and any other electric means for controlling the rudder remote from the steering gear room shall be provided with short circuit protection only. The protection shall be instantaneous and rated at 400–500 percent of the current-carrying capacity of the control system conductors. The protection means shall be located in the steering gear room just after the disconnecting means required by paragraph (b)(1) of this section.

(e) *Indicating and alarm systems for steering installations.* (1) A pilot light for each steering gear power motor and each auxiliary motor vital to the control of the rudder shall be provided at the propulsion control station, and other locations if desired, to indicate when the motors are energized.

(2) For the requirements pertaining to overload indicating lights for steering gear pilot motors, see § 111.45–5(p).

(3) The opening of a steering gear branch-circuit circuit breaker shall automatically be indicated at the propulsion control station by the sounding of an audible alarm.

Subpart 111.70—Special Requirements for Tank Vessels

§ 111.70–1 Application—TB/ALL.

(a) *General.* The requirements of this subpart contain special requirements relative to electrical installations on tank vessels. Except as modified by this subpart and regulations of Subchapter D (Tank Vessels), all other applicable regulations contained in this Subchapter J shall also apply to tank vessels.

(b) *Symbols.* The vessels and services to which each regulation applies are indicated by letters in the heading of the section or paragraph. The first letter or two letters indicates the type of vessel and the letter or letters following the oblique line indicates the waters in which such vessels may operate. The letters are described as follows:

(1) "T" signifies a tankship.

(2) "B" signifies a tank barge when it precedes an oblique line; or it signifies service on bays, sounds, and lakes other than the Great Lakes when it follows an oblique line.

(3) "ALL" signifies service on all waters.

(4) "O" signifies service on ocean waters.

(5) "C" signifies service on coastwise waters.

(6) "L" signifies service on Great Lakes waters.

(7) "R" signifies service on river waters.

§ 111.70–5 Definitions.

(a) *General—TB/ALL.* Certain terms used in this subpart are defined in this section.

(b) *Cargo—TB/ALL.* The term "cargo" means combustible liquid, flammable liquid, or liquefied flammable gas unless otherwise stated.

(c) *Cofferdam—TB/ALL.* The term "cofferdam" means a void or empty space separating two or more compartments for the purpose of isolation or to prevent the contents of one compartment from entering another in the event of the failure of the walls of one to retain their tightness.

(d) *Combustible liquid—TB/ALL.* The term "combustible liquid" means any liquid having a flash point above 80° F. (as determined from an open-cup tester, as used for test of burning oils). Combustible liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §§ 146.25–10 and 146.25–15 of Subchapter N (Dangerous Cargoes) of this chapter. In the regulations of this subchapter, combustible liquids are referred to by grades, as follows:

(1) *Grade D.* Any combustible liquid having a flashpoint below 150° F. and above 80° F.

(2) *Grade E.* Any combustible liquid having a flashpoint of 150° F. or above.

(e) *Flashpoint—TB/ALL.* The term "flashpoint" indicates the temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester. For the purpose of the regulations in this subchapter, flashpoints determined by other testing methods will be equivalent to those determined with an open-cup tester, as follows:

TABLE 111.70–5 (e)—EQUIVALENT FLASH POINTS

Open-cup tester	Tag closed-cup tester (A. S. T. M.)	Pensky-Martens closed tester (A. S. T. M.)
°F.	°F.	°F.
80	75	----------
150	----------	140

(f) *Gas free—TB/ALL.* The term "gas free" means free from dangerous concentrations of inflammable or toxic gases.

(g) *Flammable liquid—TB/ALL.* The term "flammable liquid" means any liquid which gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used for test of burning oils) at or below a temperature of 80° F. Flammable liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §§ 146.25–10 and 146.25–15 of Subchapter N (Dangerous Cargoes) of this chapter. Flammable liquids are referred to by grades, as follows:

(1) *Grade A.* Any flammable liquid having a Reid[1] vapor pressure of 14 pounds or more.

(2) *Grade B.* Any flammable liquid having a Reid[1] vapor pressure under 14 pounds and over 8½ pounds.

(3) *Grade C.* Any flammable liquid having a Reid[1] vapor pressure of 8½ pounds or less and a flashpoint of 80° F. or below.

(h) *Liquefied flammable gas—TB/ALL.* The term "liquefied flammable gas" means any inflammable gas having a Reid[1] vapor pressure exceeding 40 pounds, which has been compressed and liquefied for purposes of transportation.

[1] American Society for Testing Materials Standard D–323 (most recent revision), Method of Test for Vapor Pressure of Petroleum Products (Reid Method).

(i) *Tank barge—B/ALL.* The term "tank barge" means any tank vessel not equipped with means of self-propulsion.

(j) *Tankship—T/ALL.* The term "tankship" means any tank vessel propelled by power or sail.

(k) *Tank vessel—TB/ALL.* The term "tank vessel" means any vessel especially constructed or converted to carry liquid bulk cargo in tanks.

§ 111.70–10 Special requirements for tank vessels contracted for on or after November 19, 1955—TB/ALL.

(a) *Application.* The requirements of this section apply to all tank vessels contracted for on or after November 19, 1955.

(b) *General.* The special installation requirements, in a general manner, are contained in § 32.45–1 of Subchapter D (Tank Vessels) of this chapter, and, in some instances and to some degree, are repeated in this section for completeness of this subchapter.

(1) *Cable location.* Where practicable, electric cable shall be located well inboard from the sides, preferably along or near the centerline, to reduce the risk of injury in the event of collision, but it shall be kept clear of cargo tank openings. Specific additional requirements for cargo pump rooms and enclosed spaces immediately above or adjacent to cargo tanks are covered in paragraph (c) of this section.

(2) *Equipment location.* Except where Grade E liquids only are involved, switchboards, distribution panels, switches, fuses, and other circuit interrupting or power devices shall not be installed in cargo pump rooms nor in enclosed spaces immediately above or adjacent to cargo tanks. Regardless of the grade of liquid cargo handled by a tank vessel, storage batteries shall not be located in cargo pump rooms.

(3) *Explosion-proof installations.* Where explosion-proof equipment is required, the equipment and installation thereof shall comply with § 111.60–40 of this part.

(4) *Portable equipment.* Illumination may be obtained in any compartment by the use of approved explosion-proof, self-contained, battery-fed lamps. Otherwise, no portable electrical equipment of any type shall be used in bulk cargo tanks, fuel oil tanks, cargo pump rooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(i) The compartment itself is gas-free;

(ii) The compartments adjacent and diagonally adjacent are either (*a*) gas-free, (*b*) inerted, (*c*) filled with water, (*d*) contain Grade E liquid and are closed and secured, or (*e*) are spaces in which inflammable vapors and gases normally are not expected to accumulate; and

(iii) All other compartments of the vessel in which inflammable vapors and gases normally may be expected to accumulate are closed and secured.

(c) *Installation requirements on tank vessels handling Grade A, B, C or D liquid cargo.* The requirements of this paragraph apply only to tank vessels handling Grade A, B, C or D liquid cargo.

(1) *Lighting of cargo pump rooms.* (i) Except as otherwise permitted by subdivision (ii) of this subparagraph, cargo pump rooms shall be lighted through permanently fixed glass lenses fitted in the bulkhead and/or overhead. Each fixed glass lens shall be of rugged construction and arranged to maintain the watertight and gastight integrity of the structure. The fixed glass lens may form a part of a lighting fixture provided that all of the following conditions are complied with: (*a*) No means of access to the interior of the fixture from the pump room is provided; (*b*) The fixture is vented to the engine room or a similar non-hazardous area; (*c*) The fixture is wired from outside the pump room; and (*d*) The maximum observable temperature on the pump room surface of the glass lens based on an ambient temperature of 40° C. shall not exceed 180° C.

(ii) Where the location of a cargo pump room does not permit the lighting arrangement of subdivision (i) of this subparagraph, or where the lighting arrangement of subdivision (i) of this subparagraph, if used, would not provide the required illumination, approved explosion-proof lighting fixtures may be installed. Specific approval by the Commandant is required for the installation of approved explosion-proof lights, associated wiring and accessories.

(2) *Lighting of enclosed spaces.* Lighting of the enclosed spaces immediately above or adjacent to cargo tanks either shall comply with the requirements of subparagraph (1) of this paragraph applicable to cargo pump rooms or may be effected or supplemented by means of explosion-proof fixtures located in these spaces.

(3) *Cable.* Through runs of electric cable, regardless of how they may be protected, are prohibited in cargo pump rooms. In any enclosed space immediately above or adjacent to cargo tanks other than cargo pump rooms, through runs of electric cable are permitted.

(4) *Weather decks.* Motors, their control equipment, and other electrical equipment and installations located on or above the weather decks within 10 feet of the cargo tank openings, cargo pumproom doors or ventilation outlets, or cargo tank vent terminations shall be explosion-proof. Explosion-proof equipment installed in locations exposed to the weather shall be waterproof or shall be enclosed in watertight housings.

§ 111.70–90 Special requirements for tank vessels constructed prior to November 19, 1955—TB/ALL.

(a) *General installation requirements for tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to November 19, 1955*—(1) *Application.* The requirements of this paragraph shall apply to all tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to November 19, 1955.

(2) *General.* The electrical installation shall be in compliance with this paragraph, and to the extent that such installation is not covered by this paragraph, it shall be at least equivalent to the Commandant's general requirements.

(3) *Existing arrangements.* (i) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs or minor alterations may be made to the same standard as the original installation.

(ii) Any major change in the electrical installation or any conversion shall comply with the requirements covered by §§ 111.70–1 and 111.70–10.

(4) *Location of cables.* Where practicable, electrical cable is to be located well inboard from the sides, preferably along or near the centerline, to reduce the risk of injury in the event of collision, but it shall be kept clear of cargo tank openings. Except where Grade E liquids only are involved, feeders shall be run as far as practicable to avoid cargo pump rooms and enclosed spaces immediately adjoining cargo tanks.

(5) *Cable armor.* The armor on all cables shall be electrically and mechanically continuous.

(6) *Location of circuit-interrupting devices.* Except where Grade E liquids only are involved, switchboards, distribution panels, switches, fuses, and other current-interrupting devices shall not be fitted in cargo pump rooms or enclosed spaces immediately adjoining cargo tanks.

(7) *Portable equipment.* Portable extension cables and fittings are to be of an approved type.

(8) *Overload protection.* Main distribution circuits shall be protected against overload by circuit breaking devices, the capacity of which shall be marked at each such device.

(9) *Storage batteries.* Storage batteries shall not be located in cargo pump rooms. The space in which they are located shall be well ventilated and they shall be protected against mechanical and electrical injury including short circuiting and overloading. Batteries shall be secured against movement, and acid batteries shall be set in lead-lined trays at least 3 inches deep of at least 4-pound sheet lead.

(10) *Installations made during the Unlimited National Emergency.* Electrical equipment installed during the Unlimited National Emergency as defined in § 110.25–5 of this subchapter and not complying with the requirements of the regulations in this subchapter may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

(11) *Portable equipment.* When the vessel is not gas free, no portable electrical equipment shall be used in the cargo or fuel oil tanks, the cargo pump rooms or any enclosed space immediately above or adjacent to the bulk cargo tanks, except as permitted by § 111.70–10 (b) (4).

(b) *Cargo pump rooms and enclosed spaces of tank vessels constructed on or after July 1, 1951, but prior to November*

19, 1955—(1) *Application.* The requirements of this paragraph shall apply to cargo pump rooms and enclosed spaces immediately above the bulk cargo tanks of all tank vessels carrying Grade A, B, C, or D liquid cargo the construction or conversion of which vessels was started on or after July 1, 1951, but prior to November 19, 1955. There are no special restrictions in regard to the electrical installations in cargo pump rooms and enclosed spaces of tank vessels carrying only Grade E liquid cargo.

(2) *Equipment.* No electric lighting or power circuit-interrupting or power devices shall be installed in pump rooms or enclosed spaces immediately above the bulk cargo tanks. Through runs of electrical cable are permitted.

(3) *Lighting.* Lighting of pump rooms or the enclosed spaces immediately above the bulk cargo tanks shall be effected by means of approved explosion-proof or magazine type lighting fixtures. When the vessel is not gas free no portable lighting equipment shall be used except as permitted by § 111.70–10 (b) (4).

(c) *General cargo spaces of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955.* Regardless of location, general cargo spaces of tank vessels carrying Grade E liquid cargo only and constructed on or after July 1, 1951, but prior to November 19, 1955, shall have no special restrictions in regard to electrical installations.

(d) *Cargo pump rooms and enclosed spaces of tank vessels constructed on or after November 10, 1936, but prior to July 1, 1951*—(1) *Application.* The requirements of this paragraph shall apply to cargo pump rooms for Grade A, B, C or D liquid and to enclosed spaces required to segregate Grade A, B, C or D liquid cargo tanks from other spaces, all on tank vessels the construction or conversion of which was started on or after November 10, 1936, and prior to July 1, 1951.

(2) *Wiring.* Wiring is to be leaded and armored and shall be run through approved gastight fittings having stuffing glands at inlets and outlets.

(3) *Boxes.* Joints in wiring shall be made only in wiring appliances, such as junction boxes, outlet boxes, etc., and such boxes shall be completely metallic and shall be gastight.

(4) *Lighting fixtures.* Lighting fixtures shall be of approved type.

(5) *Motors.* Electric motors shall be of approved type either totally enclosed or ventilated to the atmosphere by suction and discharge air ducts. Separately ventilated motors are to have pressure type ventilation and shall be arranged with an automatic shutoff to open the circuit when the ventilating fan motor stops. The system is to be so interlocked that the pump motor cannot be started prior to a circulation of air. The air ducts are to lead to and from the atmosphere outside the pump room and are to terminate not less than 3 feet above the deck and not less than 6 feet from any cargo tank vent. (See § 32.-60–20 of Subchapter D (Tank Vessels) of this chapter.)

(e) *General installation requirements for tank vessels the construction or conversion of which was started prior to November 10, 1936*—(1) *Application.* The requirements of this paragraph shall apply to all steel hull tank vessels the construction or conversion of which was started prior to November 10, 1936.

(2) *General requirements.* The electrical installation shall be maintained in a safe and in a good mechanical condition, and shall comply with the regulations in effect when the vessel was built, or to the requirements of a recognized classification society. Any major change in the electrical installation or any conversion shall comply with the requirements covered by §§ 111.70–1 and 111.70–10.

(3) *Pump rooms and enclosed spaces.* The electrical installation in pump rooms and enclosed spaces immediately adjoining cargo tanks (except in pump-engine rooms as provided in § 32.70–20 of Subchapter D (Tank Vessels) of this chapter) of steel hull tank vessels handling Grade A, B, C, or D products shall be made to comply with §§ 111.55–1, 111.55–15, 111.60–5, 111.70–10 (b) (1), 111.70–10 (b) (2), 111.70–90 (a) (2), 111.70–90 (a) (9), 111.70–90 (b), and 111.70–90 (d), to the extent that the changes required are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interest of safety.

(4) *Portable equipment.* When the vessel is not gas free, no portable electrical equipment shall be used in the cargo or fuel oil tanks, the cargo pump rooms, or any enclosed space immediately above or adjacent to the bulk cargo tanks, except that lighting in these spaces may be effected by the use of approved explosion-proof, self-contained, battery-fed lamps.

Subpart 111.90—Electrical Equipment and Installations on Vessels Contracted for Prior to November 19, 1952

§ 111.90–1 General.

The electrical installations on existing vessels shall be maintained in good electrical and mechanical condition to the satisfaction of the Officer in Charge, Marine Inspection.

§ 111.90–5 Major alterations.

(a) Major alterations and major extensions to electrical installations on existing vessels shall be made to the same standard as required for new vessels. Minor repairs and minor alterations may be made to the same standard as the original installation as described in §§ 111.70–90, 111.90–10, 111.90–15, 111.90–20, and 111.90–25: *Provided*, That, in no case, will a greater departure from the standards of this subchapter be permitted than presently exist.

§ 111.90–10 Vessels contracted for prior to July 2, 1937.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the installation on vessels contracted for between June 30, 1928, and July 1, 1937, inclusive, using electricity for any purpose, shall be in keeping with the best modern practice.

(b) Except as otherwise provided for tank vessels in § 111.70–90, the changes or alterations in the electrical installations on vessels contracted for prior to June 30, 1928, shall be in accordance with the requirements of this section.

§ 111.90–15 Vessels contracted for between July 2, 1937, and January 1, 1939.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the electrical installation on vessels contracted for between July 2, 1937, and January 1, 1939, inclusive, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," AIEE Standard No. 45, October 1930, as published by the Institute of Electrical and Electronic Engineers.

§ 111.90–20 Vessels contracted for between January 2, 1939, and June 1, 1941.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the electrical installation on vessels contracted for between January 2, 1939, and June 1, 1941, inclusive, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," AIEE Standard No. 45, December 1938, as published by the American Institute of Electrical Engineers.

§ 111.90–25 Vessels contracted for between June 2, 1941, and November 18, 1952.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the electrical installation on vessels contracted for between June 2, 1941, and November 18, 1952, inclusive, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," AIEE Standard No. 45, July 1940, as published by the Institute of Electrical and Electronic Engineers.

(b) Except as otherwise provided for tank vessels in § 111.70–90, the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, is, during the Unlimited National Emergency, applicable as alternative provisions to those contained in this section for vessels the contract for the construction of which was signed prior to September 2, 1945.

(c) Except as otherwise provided for tank vessels in § 111.70–90, those parts of the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, specified in paragraphs 1, 4 and 5, thereof relating to electric cable, are, during the Unlimited National Emergency, applicable as alternative provisions to those contained in this section for vessels the contract for the construction of which was signed on and after September 2, 1945.

PART 112—EMERGENCY LIGHTING AND POWER SYSTEM

Subpart 112.01—Application

Sec.
112.01–1 General.

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Subpart 112.15—Emergency Loads

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112.25–1 Emergency Loads.
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Subpart 112.30—Operation of Emergency Systems Having an Automatically Connected Storage Battery as the Sole Source of Emergency Lighting and Power

112.30–1 Emergency loads.
112.30–5 Reduction of potential.
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Subpart 112.35—Operation of a Manually Controlled Emergency System Having a Storage Battery or a Diesel-Engine-Driven Generator as the Sole Source of Emergency Lighting and Power

112.35–1 Manual operation requirements.
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112.40–1 General requirements.

Subpart 112.45—Visible Indicators and Test Switch

112.45–1 Visible indicators.
112.45–5 Test switch.

Subpart 112.50—Emergency Diesel-Engine-Driven Generator Sets

112.50–1 General requirements.

Subpart 112.55—Storage Battery Installation

112.55–1 General requirements.
112.55–5 Emergency lighting loads.
112.55–10 Storage battery requirements.
112.55–15 Capacity of storage battery.
112.55–20 Diesel engine cranking batteries.

Subpart 112.90—Emergency Lighting and Power Systems for Vessels Contracted for Prior to November 19, 1952

112.90–1 General.
112.90–5 Emergency lighting system for ocean and coastwise passenger vessels contracted for prior to November 19, 1952.
112.90–10 Emergency lighting system for passenger vessels other than ocean and coastwise passenger vessels contracted for prior to November 19, 1952.

AUTHORITY: The provisions of this Part 112 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 112.01—Application

§ 112.01–1 General.

The provisions of this part, with the exception of Subpart 112.90, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of Subpart 112.90, shall apply to all vessels contracted for prior to November 19, 1952.

CROSS REFERENCE: See § 110.05–3 of this subchapter for application of amendments to regulations.

Subpart 112.05—General Requirements

§ 112.05–1 Intent.

(a) The intent of the provisions in this part is to assure that vessels are provided with a dependable, independent emergency source of electrical power with sufficient capacity to supply all those services that are necessary for the safety of the passengers and/or the crew in an emergency.

(b) Nonemergency loads may be supplied from the emergency source only when the emergency source has adequate capacity to supply all loads that may be connected to the emergency source simultaneously.

§ 112.05–5 Emergency source of supply.

(a) The emergency source of supply shall be of a type and capacity in accordance with Table 112.05–5(a), except as otherwise provided by § 112.05–15.

TABLE 112.05–5(a)

Size of vessel and service	Type or types of emergency source of power	Period of operation and minimum capacity of emergency source of power
Passenger vessels over 65 feet in length		
Ocean and Coastwise, 1,600 g.t. and over, and any passenger vessel, regardless of tonnage or service, where electric power-operated watertight doors are required.	Storage battery with automatic transfer gear for temporary source, and supplemented by diesel generator with automatic starting and transfer gear for final source.	½ hour. 36 hours.
Ocean and Coastwise, over 15 g.t. but less than 1,600 g.t.[1]	Storage battery with automatic transfer gear or diesel generator with automatic starting and transfer gear.	36 hours or twice the time of run, whichever is the smaller.
Other than Ocean and Coastwise, 100 g.t. and over.[1]	Storage battery with automatic transfer gear or diesel generator with automatic starting and transfer gear.	8 hours or twice the time of run, whichever is the smaller.
Other than Ocean and Coastwise, over 15 g.t. but less than 100 g.t.[1]	Storage battery or diesel generator with automatic or manual operation.[2]	8 hours or twice the time of run, whichever is the smaller.
Cargo and miscellaneous self-propelled vessels and tank ships; barges with sleeping accommodations for more than 6 persons.[3]		
All waters, 1,600 g.t. and over.	Storage battery or diesel generator automatic or manual operation.	12 hours.
All waters, 300 g.t. and over, but less than 1,600 g.t.	Storage battery or diesel generator, automatic or manual operation, or approved relay-controlled battery-operated lanterns.[5]	12 hours or twice the time of run, whichever is the smaller.[4]

[1] See also § 112.05–15.
[2] See also §§ 112.35–1 and 112.35–5.
[3] Applicable to barges contracted for on or after November 19, 1958.
[4] Minimum period of operation of relay-controlled, battery-operated lanterns may be less than 12 hours but not less than 6 hours.
[5] Battery-operated lanterns shall have rechargeable batteries, shall incorporate an automatic battery charger that will maintain the battery in a fully charged condition, and shall not be readily portable.

(b) The emergency source of supply shall be independent of the vessels' ship's service lighting and powerplant and propulsion plant.

(c) The complete emergency installation shall function satisfactorily when the ship is inclined 22½ degrees and/or when the trim of the ship is 10 degrees.

(d) The emergency source of supply shall be located aft of the collision bulkhead and outside the machinery casing.

(1) On passenger vessels the emergency source of supply shall be located above the bulkhead deck or above the freeboard deck, whichever is the higher.

(2) On cargo and miscellaneous vessels, including tankships and barges, the emergency source of supply shall be located above the freeboard deck, or above the uppermost continuous deck, whichever is the higher.

(e) When a compartment containing the emergency source of electric power, or vital components thereof, adjoins a space containing either the ship's service generators or machinery necessary for the operation of the ship's service generators, all common bulkheads and/or decks shall be protected by approved "structural insulation" or other approved material. This protection shall be such as to be capable of preventing an excessive temperature rise in the space containing the emergency source of electric power, or vital components thereof, for a period of at least one hour in the event of fire in the adjoining space. Bulkheads or decks meeting Class A–60 requirements, as defined by § 72.05–10 in Subchapter H (Passenger Vessels) of this chapter, will be considered as meeting the requirements of this paragraph.

(f) Except for those cables used to connect equipment located in the engineroom or boilerroom, all cables emanating from the emergency switchboard shall be run so as to avoid penetrating the boundaries of the engineroom, boilerroom or the uptakes and casings of these spaces. All such cables shall be kept clear of the bulkheads and decks forming these boundaries.

(g) The emergency switchboard shall be installed as near as practicable to the emergency source of power.

(h) When the emergency source of power is a generator, the emergency switchboard shall be located in the same space as the emergency source of power, unless the operation of the emergency switchboard would thereby be impaired.

§ 112.05–10 Emergency lights.

(a) Emergency lights supplied by an automatic emergency lighting system shall form a part of the regular lighting system, and shall be continuously lighted at all times passengers or crew are aboard, except as provided by paragraph (b) of this section and § 112.05–15(c), and except when the emergency lights consist of relay-controlled battery-operated lanterns. (See footnote 5 in Table 112.05–5(a).)

(b) Emergency lights for the illumination of boats and embarkation decks, lifeboat launching gear, wheelhouse, chart room, and navigating instruments need not be continuously lighted and, except as provided otherwise in this paragraph, shall be controlled by switches located in the wheelhouse.

(1) On "island type" vessels, such as tankers and Great Lakes' bulk freighters, lighting for illumination of lifeboats, launching gear and embarkation areas remote from the wheelhouse island may be controlled from a central location within the island involved in lieu of from the wheelhouse.

(c) Emergency lights shall be marked with a letter "E" of at least ½-inch in height as required by § 78.47–33 of Subchapter H (Passenger Vessels), and § 97.37–25 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

§ 112.05–15 Emergency lighting system for small passenger vessels.

(a) Small passenger vessels, certificated to operate only between sunrise and sunset, may be permitted to operate without an emergency lighting system.

(b) Small passenger vessels, certificated to operate not more than 15 miles offshore, may be permitted to operate without an emergency lighting system provided all of the conditions, where applicable, contained in this paragraph are complied with.

(1) The source of supply of the general lighting system must be independent of the propulsion plant.

(2) On vessels required to meet at least a one compartment standard of subdivision, the source of supply of the general lighting system must be located above the bulkhead deck.

(c) On small passenger vessels having no sleeping accommodations for passengers and requiring not more than 10 emergency lights, the automatic emergency lighting system need not form a part of the regular lighting system and need not be continuously lighted. Individual storage-battery-operated automatic emergency lighting units will be acceptable for such vessels in lieu of a single source emergency lighting system provided the units incorporate an automatic battery charger, are not readily portable, and have sufficient capacity for not less than 6 hours continuous operation.

Subpart 112.10—Classifications of Emergency Lighting and Power Systems

§ 112.10–1 General.

(a) Emergency lighting and power systems are classified in accordance with the method provided to cause the system to apply potential to the emergency loads and in accordance with the basic function of the system.

§ 112.10–5 Manual emergency lighting and power system.

(a) A manual emergency lighting and power system is one in which a single manual operation, such as the manual operation of a switch from an "off" to an "on" position, is required to cause the emergency lighting and power system to supply power to the emergency loads.

§ 112.10–10 Automatic emergency lighting and power system.

(a) An automatic emergency lighting and power system is one in which a specified reduction in potential from the ship's service power and lighting plant will cause the emergency lighting and power system to supply power to the emergency loads.

§ 112.10–15 Temporary source of emergency lighting and power.

(a) A temporary source of emergency lighting and power is one of limited capacity designed to carry, for a short time, selected emergency loads while an emergency source of larger capacity is being started.

§ 112.10–20 Final source of emergency lighting and power.

(a) A final source of emergency lighting and power is one designed to function subsequent to the termination of the temporary source.

Subpart 112.15—Emergency Loads

§ 112.15–1 Temporary emergency source loads.

(a) The emergency lighting and power loads listed in this section shall be arranged so that they can be energized from the temporary emergency source.

(b) Navigation light indicator panel, if required by § 113.55–25 of this subchapter.

(c) A sufficient number of lights throughout machinery spaces to permit the performance of essential operations and observations under emergency conditions and to facilitate restoration of service.

(d) Lighting for passageways, stairways, and escape trunks in passenger quarters, crew quarters, public spaces, machinery spaces and work spaces, adequate to permit passengers and crew readily to find their way to open decks and to lifeboat embarkation and assembly points with all watertight doors and fire screen doors closed.

(e) Illuminated signs bearing the word "Exit" in red letters shall be installed in such locations throughout a passenger vessel so that from any portion of the vessel normally accessible to the passengers or crew, except machinery spaces, and except stores and similar spaces where the crew are not normally employed, and with all fire doors in stairway inclosures and main vertical zone bulkheads closed and all watertight doors closed, the direction of escape to the open deck will be apparent. For the purpose of this paragraph, individual staterooms and other similar small rooms will not be required to have such signs, but upon emerging from such rooms the direction of escape shall be apparent. (Also see § 111.50–15 (d) of this subchapter.)

(f) General illumination for safe operation of watertight doors, if installed and power operated.

(g) One or more lights in galleys, pantries, steering gear room, emergency power rooms, chart room, wheelhouse, and crews' mess and recreation rooms.

(h) Lighting for boat and embarkation decks and passenger assembly points for safe embarkation into the lifeboats.

(i) Electric communication systems essential under temporary emergency conditions and which do not have an independent storage battery source of power.

(j) Watertight door system, if installed and power operated.

(k) Emergency loudspeaker system, if installed.

(l) Fire screen door holding and release system, if installed.

(m) Supply to motor-generator or other conversion equipment where a temporary emergency source of alternating current is necessary for essential

communication systems, emergency or safety requirements.

§ 112.15–5 Final emergency source loads.

(a) The emergency lighting and power loads listed in paragraphs (b) to (l), inclusive, of this section shall be arranged so that they can be energized from the final source. It is recommended that loads listed in paragraphs (j) to (p), inclusive, of this section be arranged so that they can be energized from the final source where the capacity and character of the emergency plant will permit.

(b) All loads listed in § 112.15–1, as indicated.

(c) Illumination for the safe operation of the lifeboat and liferaft launching gear and the lifeboats and liferafts in the process of, and immediately after, being launched.

(d) Charging panels of temporary emergency battery and of starting battery for diesel engine driving emergency generator.

(e) One of the bilge pumps, if dependent upon the emergency generator for its source of power to comply with Part 55 of Subchapter F (Marine Engineering) of this chapter.

(f) One of the fire pumps, if dependent upon the emergency generator for its source of power to comply with Part 34 of Subchapter D (Tank Vessels), Part 76 of Subchapter H (Passenger Vessels), or Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(g) Sprinkler system pump or water spray extinguishing system pump, if dependent upon the emergency generator for its source of power to comply with Part 76 of Subchapter H (Passenger Vessels) of this chapter.

(h) Daylight signaling lights, if installed.

(i) Smoke detector system, if installed.

(j) Radio installation, if installed.

(k) Radio direction finder, if installed.

(l) Loran, if installed.

(m) Radar plan position indicator, if installed.

(n) Gyrocompass, if installed.

(o) Depth sounder, if installed.

(p) Electric whistle and siren control, if installed.

§ 112.15–10 Single automatically started source loads.

When only a single automatically started source of emergency lighting and power is installed, the circuits listed in § 112.15–5, as indicated, shall be arranged so that they can be energized from the single emergency source of supply.

§ 112.15–15 Manually started source loads.

(a) When a manually started emergency lighting and power system is installed, the circuits listed in § 112.15–5, as indicated, shall be arranged so that they may be energized from the emergency source of supply.

Subpart 112.20—Operation of Emergency Systems Having Both a Temporary and a Final Source of Emergency Lighting and Power

§ 112.20–1 Emergency loads.

(a) The emergency loads listed in Subpart 112.15, as indicated, shall normally be energized from the ship's service generating plant through automatic transfer switches.

§ 112.20–5 Failure of power from the normal source.

(a) In the event of a reduction of potential of the normal source by 15 to 40 percent of normal value, the loads listed in § 112.15–1 shall automatically be supplied from the temporary source of emergency lighting and power. For systems in which a reduction of frequency of the normal source or final source will adversely affect the emergency system and emergency loads, suitable means shall be provided to transfer the loads listed in § 112.15–1 to the temporary source.

§ 112.20–10 Diesel driven emergency source of power.

(a) Simultaneous with the operation described in § 112.20–5, the diesel engine driving the final source (emergency generator) shall automatically be started with no load connected to the emergency generator.

§ 112.20–15 Potential of final source.

(a) When the potential of the final source (emergency generator) reaches 85 to 95 percent of normal value, the emergency loads listed in Subpart 112.15, as indicated, shall automatically be transferred to this final source.

(b) When potential from the ship's service generating plant has been restored to normal, the emergency loads may be manually transferred to the normal source and the emergency generator manually stopped.

(c) Should the potential of the final source (emergency generator), while supplying the emergency loads, fall below 75 to 85 percent of normal value, the temporary emergency loads shall again be transferred to the temporary source as described in § 112.20–5.

Subpart 112.25—Operation of Emergency System Having an Automatic Starting Diesel-Engine-Driven Emergency Generator as the Sole Source of Emergency Lighting and Power

§ 112.25–1 Emergency loads.

(a) The emergency loads listed in § 112.15–5, as indicated, shall normally be energized from the ship's service generating plant through automatic transfer switches.

§ 112.25–5 Reduction of potential.

(a) In the event of failure of power from the normal source, such as a reduction of potential by 15 to 40 percent of normal value, the engine driving the emergency generator shall automatically be started with no load connected to the emergency generator.

§ 112.25–10 Operation requirements.

(a) When the potential of the emergency generator reaches 85 to 95 percent of normal value, the emergency loads shall automatically be connected to the emergency generator.

(b) When potential from the ship's service generating plant has been restored to normal, the emergency loads may be manually transferred to the normal source and the emergency generator manually stopped.

Subpart 112.30—Operation of Emergency Systems Having an Automatically Connected Storage Battery as the Sole Source of Emergency Lighting and Power

§ 112.30–1 Emergency loads.

(a) The emergency loads listed in § 112.15–5, as indicated, shall normally be energized from the ship's service generating plant through automatic transfer switches.

§ 112.30–5 Reduction of potential.

(a) Upon reduction of potential from the normal source by 15 to 40 percent of normal value, the emergency loads shall automatically be disconnected from the normal source and connected to the emergency storage battery.

§ 112.30–10 Operation requirements.

(a) Upon restoration of potential from the normal source of 85 to 95 percent of normal values, the emergency loads shall automatically be transferred back to the normal source.

Subpart 112.35—Operation of a Manually Controlled Emergency System Having a Storage Battery or a Diesel-Engine-Driven Generator as the Sole Source of Emergency Lighting and Power

§ 112.35–1 Manual operation requirements.

(a) Manually started emergency lighting and power systems shall require only a single manual operation, such as the manual operation of a switch from an "off" to an "on" position, to cause the emergency system to supply its connected loads.

§ 112.35–5 Means for starting.

(a) The starting means shall be located in the wheelhouse or so as to be under the control of the chief engineer.

Subpart 112.40—Installations Requiring an Alternating-Current Temporary Source of Supply

§ 112.40–1 General requirements.

(a) Installations requiring alternating current for the operation of communication equipment or other apparatus essential under temporary emergency conditions shall be provided with the necessary conversion equipment. Where such conversion equipment will be op-

erating both under normal conditions and under temporary emergency conditions, the conversion equipment shall be provided in duplicate.

Subpart 112.45—Visible Indicators and Test Switch

§ 112.45–1 Visible indicators.

(a) Visible indicators shall be provided in the machinery space to indicate when the emergency battery is being discharged and when the emergency loads are being supplied by an automatically controlled emergency source of supply (storage battery or emergency diesel generator).

§ 112.45–5 Test switch.

(a) A test switch shall be provided at the emergency switchboard or other location as may be approved to simulate a failure of potential from the normal source, the operation of which switch will cause the emergency loads to be transferred.

Subpart 112.50—Emergency Diesel-Engine-Driven Generator Sets

§ 112.50–1 General requirements.

(a) The diesel engine of the generator set shall be complete with all accessories necessary for operation and protection of the engine, shall have a self-contained cooling system of size to assure continuous engine operation using 100° F. air, and the fuel used shall have a flash point of not less than 110° F. The room in which the set is located shall be provided with suitable intake and exhaust ducts to supply adequate cooling air. The diesel engine as installed shall be without starting aid except that a thermostatically controlled electric water jacket heater, connected to the final emergency bus, may be employed. The diesel engine as installed shall be capable of carrying its full rated load within 20 seconds after cranking is initiated with the intake air, room ambient, and starting battery all at a temperature of 32° F. The diesel engine shall be electric starting unless otherwise approved, and the starting battery shall be of sufficient capacity to provide six consecutive cycles of cranking, each cycle to consist of approximately one-half minute of cranking at a speed recommended by manufacturer followed by approximately one minute of battery rest, with the intake air, room ambient, and starting battery at a temperature of 32° F. At the end of the sixth cycle of cranking, the battery voltage while cranking the engine, shall be not less than 50 percent of nominal voltage. The diesel-engine-driven generator set shall lubricate and operate satisfactorily when permanently inclined to an angle of 22½ degrees athwartship and 10 degrees fore and aft, and shall be arranged so that it will not spill oil under a vessel roll of 30 degrees each side of the vertical. Units depending on forced lubrication shall be provided with an audible alarm device to sound on loss of oil pressure while running.

(b) Hydraulic means of starting the diesel engine will be considered equally acceptable to the electric means described in paragraph (a) of this section provided all the following conditions are met:

(1) The hydraulic cranking device shall be a self-contained system which will provide the required cranking forces and engine starting RPM as recommended by engine manufacturer.

(2) Electrically operated means shall automatically provide and maintain the stored hydraulic pressure within the predetermined pressure limits.

(3) The means of automatically maintaining the hydraulic system within the predetermined pressure limits shall be energized from the final emergency bus.

(4) Means shall be provided to manually recharge the hydraulic system.

(5) Charging of the hydraulic cranking system shall not create an absence of hydraulic power for engine starting at any time.

(6) The capacity of the hydraulic cranking system shall provide not less than 6 cranking cycles. Each cranking cycle shall provide the necessary number of revolutions at the required RPM to permit the diesel engine to meet the requirements of carrying its full rated load within twenty seconds after cranking is initiated with intake air, room ambient temperature and hydraulic cranking system at 32° F.

(7) Capacity of the hydraulic cranking system sufficient for three starts under conditions of subparagraph (6) of this paragraph shall be held in reserve and arranged so that the operation of a single control by one person will isolate the discharged or initially used part of the system and permit the reserve capacity to be employed.

Subpart 112.55—Storage Battery Installation

§ 112.55–1 General requirements.

(a) Storage batteries for emergency lighting and power systems, including starting batteries for emergency diesel-engine driven generator sets, shall be of a design and construction proven successful in merchant marine service, and capable of withstanding the roll and pitch of a vessel and exposure to salt air. Positive plates of lead-acid batteries shall be at least 0.25 inch thick, and the specific gravity of the electrolyte when fully charged shall be 1.210 to 1.220, both inclusive, at 25° C., except that thin positive plate construction (0.125 inch thick minimum) may be used for engine cranking batteries. The fully charged specific gravity of the electrolyte of lead-acid engine cranking batteries shall not exceed 1.260 at 25° C. for high watering space type batteries or 1.285 at 25° C. for normal watering space type batteries.

§ 112.55–5 Emergency lighting loads.

(a) When supplying emergency lighting loads, the storage battery initial voltage shall not exceed the standard system voltage by more than 5 percent.

§ 112.55–10 Storage battery requirements.

(a) Storage battery installations for emergency lighting and power, including starting batteries for emergency diesel-engine driven generator sets, shall include the necessary apparatus automatically to maintain the battery in a fully charged condition. At all times when the ship's service source of supply is available, the battery shall be furnished a continuous trickle charge, except that after a battery discharge, the battery shall be automatically charged at a higher rate until the battery voltage increases to a predetermined point. Charging operations shall not create an absence of battery power at any time. Instruments to show the rate of charge shall be provided.

§ 112.55–15 Capacity of storage battery.

(a) The capacity of a storage battery shall be ample to close each watertight door three times and to open each watertight door two times, and to carry the remaining emergency loads continuously for the duration of time required by § 112.05–5(a), at the end of which time the potential of the storage battery shall be not less than 87.5 percent of standard system voltage. The nominal potential of a lead-acid storage battery will be taken as 2.0 volts per cell; the nominal potential of nickel-alkaline storage batteries will be taken as from 1.2 to 1.4 volts per cell.

§ 112.55–20 Diesel engine cranking batteries.

(a) Batteries used for starting emergency diesel engine generator sets shall be either the lead-acid or nickel-cadmium type.

Subpart 112.90—Emergency Lighting and Power Systems for Vessels Contracted for Prior to November 19, 1952

§ 112.90–1 General.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in Subparts 112.05 through 112.55, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of Subparts 112.05 through 112.55 be permitted than presently exist.

(b) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 112.90–5 Emergency lighting system for ocean and coastwise passenger vessels contracted for prior to November 19, 1952.

(a) The emergency lighting system for ocean and coastwise passenger vessels

contracted for prior to November 19, 1952, shall be in accordance with this section.

(b) Provision shall be made on all passenger vessels for an electric or other system of lighting, sufficient for all requirements of safety, in the different parts of the ship. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system, and placed in the upper parts of the ship above the margin line.

(c) The exit from every main compartment occupied by passengers or crew shall be continuously lighted by an emergency lamp. The power for these emergency lamps shall be so arranged that they will be supplied from the independent installations referred to in paragraph (b) of this section in the event of failure of the main generating plant.

(d) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal combustion engines are replaced, the emergency generator shall be driven by a diesel or semi-diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

(e) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when along side and in process of, or immediately after, being launched. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck.

(1) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set.

§ 112.90–10 Emergency lighting system for passenger vessels other than ocean and coastwise passenger vessels contracted for prior to November 19, 1952.

(a) The emergency lighting system for passenger vessels other than ocean and coastwise passenger vessels contracted for prior to November 19, 1952, shall be in accordance with this section.

(b) All vessels engaged in the passenger service, which are electrically lighted by dynamos or other electric units, located below the deep-load line of the vessel, shall have on board an emergency electric lighting system located above the deep-load line to light the vessel sufficiently to enable the passengers and crew to find their way to the exits in the event of failure of the main lighting system. The emergency lighting system shall at all times be ready for immediate use, and shall be installed and arranged so that all emergency lights may be switched on from the pilothouse, navigation bridge, or a central station.

(c) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal-combustion engines are replaced, the emergency generator shall be driven by a diesel or semi-diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

(d) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of, or immediately after, being launched. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck.

(1) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set.

PART 113—COMMUNICATION AND ALARM SYSTEMS AND EQUIPMENT

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Subpart 113.01—Application

§ 113.01–1 Vessels subject to requirements.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

Subpart 113.05—General Provisions

§ 113.05–1 Supplementary requirements.

(a) The provisions of this part are supplementary to the general requirements for electrical systems and apparatus contained in this subchapter.

113.05–5 Equipment of an approved type.

(a) Where equipment in this part is required to be of an approved type, such equipment shall be of a type approved by the Commandant.

(b) Specifications for many of the items required to be of an approved type have been promulgated and are contained in Subchapter Q (Specifications) of this chapter. In general, such specifications are of interest only to the manufacturer of specific items of equipment.

§ 113.05–10 Wiring.

(a) Hook-up wire for use within the components of the equipment specified in this part shall be of soft stranded annealed copper of suitable cross section to provide ample and safe current carrying capacity and mechanical strength. Hook-up wire shall be in accordance with MIL–W–76, MIL–W–16878 types B, C, D, E, EE, and FF, or with Subpart 111.60 of this subchapter.

(b) All external wiring and wiring between components shall be in accordance with Subpart 111.60 of this subchapter.

Subpart 113.10—Automatic Fire Detecting and Alarm Systems

§ 113.10–1 Application.

(a) Where an electric fire detecting and alarm system is installed, the provisions of this subpart, with the exception of § 113.10–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.10–90.

(b) For the vessels on which an automatic fire detecting and alarm system is required see Part 76 of Subchapter H (Passenger Vessels) of this chapter.

§ 113.10–5 General requirements.

(a) Fire alarm annunciators, power supply, fire detectors, test stations, and vibrating bells shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1959, shall meet the requirements of Subpart 161.002 of Subchapter Q (Specifications) of this chapter.

(b) All electric cables installed in conjunction with fire detecting and alarm system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(c) Cable runs between the fire alarm annunciator and fire detecting zones shall be as direct as possible, and shall avoid, where possible, staterooms, lockers, and other enclosed spaces where this cable could be damaged by a localized fire or by other causes.

(d) Conductors for several fire detecting zones may be run in a multi-conductor cable, but a conductor shall not be used as a common return from two or more zones.

(e) Connection boxes containing conductors to more than one fire detecting zone shall be of watertight construction and the cable entrances shall be made tight by means of terminal or stuffing tubes.

(f) Connection boxes for fire detector stations, manual alarm stations, test stations, or other boxes containing the conductors of a single fire detecting zone, may be of nonwatertight construction, if installed in a dry location.

§ 113.10–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in § 113.10–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of § 113.10–5 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements.

(b) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the Institute of Electrical and Electronic Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions:

(1) All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored.

(2) Lead-sheathed conductors may be used for voltages of 60 volts or less.

(3) In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel.

Subpart 113.15—Manual Fire Alarm Systems

§ 113.15–1 Application.

(a) Where an electric manual fire alarm system is installed, the provisions of this subpart, with the exception of § 113.15–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.15–90.

(b) For the vessels on which a manual fire alarm system is required, see Part 76 of Subchapter H (Passenger Vessels) of this chapter.

§ 113.15–5 General requirements.

(a) Manual fire alarm annunciator, power supply, manual stations, and vibrating bells shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1959, shall meet the requirements of Subpart 161.002 of Subchapter Q (Specifications) of this chapter.

(b) All electric cables installed in conjunction with manual fire alarm systems shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(c) Cable runs between the annunciator and fire alarm zones shall be as direct as possible, and shall avoid, where possible, staterooms, lockers, and other

enclosed spaces where the cable could be damaged by a localized fire or by other causes.

(d) Conductors for several fire alarm zones may be run in a multiconductor cable, but a conductor shall not be used as a common return from two or more zones.

(e) Connection boxes containing conductors to more than one fire alarm zone shall be of watertight construction and the cable entrances shall be made tight by means of terminal or stuffing tubes.

(f) Connection boxes for manual stations, or other boxes containing the conductors of a single fire alarm zone, may be of nonwatertight construction if installed in a dry location.

§ 113.15–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in § 113.15–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of § 113.15–5 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements.

(b) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions:

(1) All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored.

(2) Lead-sheathed conductors may be used for voltages of 60 volts or less.

(3) In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel.

Subpart 113.20—Automatic Sprinkler Systems

§ 113.20–1 Application.

(a) When an automatic sprinkler system is installed, the provisions of this subpart, with the exception of § 113.20–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.20–90.

§ 113.20–5 General requirements.

(a) The general requirements for automatic sprinkler systems are contained in Subpart 76.25 of Subchapter H (Passenger Vessels) of this chapter.

(b) The sprinkler alarm system, including annunciator, power supply, alarm switches, and bells shall be of an approved type.

(c) All electric cable employed in a sprinkler alarm system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(d) All connection boxes, alarm switches, pressure switches, or level switches, etc., employed in the system shall be of watertight construction.

§ 113.20–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in § 113.20–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of § 113.20–5 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements.

(b) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions:

(1) All conductors shall be lead-sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored.

(2) Lead-sheathed conductors may be used for voltages of 60 volts or less.

(3) In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multi-conductor cable may be used to connect the several individual zones to the annunciator panel.

(c) Where a motor-driven sprinkler pump is installed, it shall be capable of being operated from the emergency electrical circuit in case of failure of the main power.

Subpart 113.25—General Alarm Systems

§ 113.25–1 Application.

(a) The provisions of this subpart, with the exception of §§ 113.25–25 and 113.25–90, shall apply to all manned vessels of over 100 gross tons, except barges, scows, and similar vessels, contracted for on or after November 19, 1952.

(b) The provisions of § 113.25–25 shall apply to all manned ocean and coastwise barges of over 100 gross tons, where the crew is divided into watches for the purpose of steering, contracted for on or after November 19, 1952.

(c) The provisions of § 113.25–30 shall apply to all barges of 300 gross tons and over contracted for on or after November 19, 1958, with sleeping accommodations for more than 6 persons.

(d) The provisions of § 113.25–90 shall apply to all manned vessels of over 100 gross tons, except barges, scows, and similar vessels, contracted for prior to November 19, 1952.

§ 113.25–5 Operation.

(a) The general alarm system shall consist of electric vibrating bells located throughout passengers' and crew's quarters, machinery spaces, and work spaces, and so located as to warn all occupants in an emergency.

(b) The general alarm system shall be operated by means of a manually operated contact maker located in the wheelhouse. On tankships the general alarm system shall also be controlled by means of a manually operated contact maker located in an accessible location in the deck officers' quarters and in the engineroom. On vessels other than tank vessels one additional contact maker may be installed in an accessible location other than the wheelhouse. Except for those installed in the wheelhouse, all contact makers shall be protected against tampering by means of an enclosure provided with a breakable transparent window.

(c) On vessels on which an emergency squad is organized and on vessels having a manual fire alarm system, a second manually operated contact maker shall be located in the wheelhouse and so connected as to operate only the general alarm bells located in crew's quarters and machinery spaces.

§ 113.25–10 General requirements.

(a) *Power supply.* (1) The power supply for the general alarm system shall be a storage battery located above the bulkhead deck or above the freeboard deck, whichever is the higher, and in a protected area outside the machinery casing.

(2) The nominal potential of the general alarm system shall be not less than 6 volts and not more than 120 volts.

(3) The general alarm system supply shall be one of the following types:

(i) One storage battery, used for no other purpose, in combination with an automatic charging panel that will maintain the battery in a fully charged condition at all times except immediately following a discharge. The storage battery shall have sufficient capacity to supply the general alarm system continuously for a period of at least 8 hours without being recharged;

(ii) Duplicate storage batteries, used for no other purpose, and so connected, in combination with a manual two-position transfer switch (having no OFF position), that one battery will be charged while the other battery is available for furnishing power to the system. Each of the two storage batteries shall have sufficient capacity to supply the general alarm system continuously for a period of at least 4 hours without being recharged;

(iii) A circuit connected to the temporary emergency bus of an emergency

switchboard as provided for by § 112.15–1 (i) of this subchapter; or

(iv) A circuit from an interior communication switchboard, the interior communication switchboard being supplied by duplicate storage batteries so connected, in combination with a manual two-position transfer switch (having no OFF position), that one battery will be charged while the other battery is available for furnishing power to the switchboard. The interior communication batteries shall each be of sufficient capacity to supply without recharging the general alarm system continuously for a period of 4 hours and to supply all other connected loads at maximum expected demand for a period of at least 8 hours.

(4) When the general alarm system is the only load supplied by the general alarm system battery or batteries, the battery or batteries shall be protected against overcurrent by enclosed fused switches or circuit breakers, having provisions for locking to prevent either unauthorized operation of the switch or circuit breaker or unauthorized tampering with the fuses. The fused switch or circuit breaker shall be located outside of, but adjacent to, the battery room or battery locker, and the capacity of the fuses or circuit breaker shall be not less than 200 percent of the connected load.

(5) When the general alarm system is supplied from an emergency or interior communication switchboard, the fused switch or circuit breaker supplying the general alarm system shall have provisions for locking to prevent either unauthorized operation of the switch or circuit breaker or unauthorized tampering with the fuses.

(b) *Distribution of general alarm system feeders and branch circuits.* (1) A feeder distribution panel shall be provided to divide the system into the required number or zone feeders. The distribution panel shall afford overcurrent protection for each zone feeder, but no disconnect switches shall be provided. The distribution panel shall be located above the bulkhead deck or above the freeboard deck, whichever is the higher, and outside the machinery casing.

(2) At least one feeder shall be provided for each vertical fire zone in which general alarm bells are located.

(3) One or more branch circuit distribution panels shall be provided for each zone feeder with at least one fused branch circuit for each deck level. The distribution panel shall be located above the bulkhead deck or above the freeboard deck, whichever is the higher, in the zone served, and no disconnect switches shall be provided for the branch circuits.

(4) No more than five general alarm bells shall be connected to one branch circuit, and a branch circuit shall not supply bells on more than one deck level.

(5) On vessels not divided into fire zones by main vertical fire bulkheads, the vessel shall be divided into vertical zones not exceeding 150 feet in length and a general alarm feeder provided for each such zone in which general alarm bells are required.

(6) On vessels where accommodation spaces are located only at the extremities of the vessels, other arrangements of feeders and branch circuits will be considered.

(c) *Location of general alarm bells.* (1) General alarm bells shall be so distributed throughout passengers' and crew's quarters in such number and in such a manner as to obtain in each room with the door closed either:

(i) A sound level of not less than 75 decibels; or

(ii) A sound level of 6 decibels above the ground noise level existing when the vessel is underway in moderate weather, whichever is the higher.

(2) General alarm bells shall be so distributed throughout public spaces, work spaces, and machinery spaces in such number and in such a manner as to warn all occupants in an emergency.

§ 113.25–15 Detail requirements.

(a) *Storage batteries.* (1) Storage batteries shall comply with the requirements of Subpart 112.55 of this subchapter.

(2) At the end of the discharge period specified by § 113.25–10(a), the battery potential shall be not less than 80 percent of nominal potential under load.

(b) *Contact maker.* (1) The contact maker shall be a normally open circuit spring-return-to-normal type of enclosed watertight switch.

(2) The contact maker shall be designed to close its contacts when a substantial operating handle is rotated in a clockwise direction through an arc of approximately 60 degrees.

(3) The switch handle shall have means provided for locking in the ON position by means of a spring loaded locking pin.

(4) The OFF and ON positions of the operating handle shall be indicated by means of prominently raised letters.

(5) The contact maker shall be provided with mechanical stops to limit the rotation of the operating handle.

(6) The contact maker shall have an inductive load rating not less than the connected load. On large vessels, consideration will be given to the use of auxiliary devices to interrupt the load current.

(c) *Vibrating bells.* (1) Vibrating bells installed in conjunction with a general alarm system shall be of a type approved by the Commandant.

(2) General alarm system vibrating bells shall produce a signal of a tone distinct from that of any other bell signals on the vessel.

(d) *Electric cable and distribution fittings.* (1) All cable installed in conjunction with general alarm systems shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(2) Cable entrances to all bells and distribution fittings shall be made watertight by means of terminal or stuffing tubes.

(3) Distribution panels shall be of watertight construction and shall be of a type requiring the use of a tool to gain entrance to the box.

(4) All fuses employed in a general alarm system shall be 250-volt National Electric Code standard, non-renewable cartridge fuses bearing the approval label of a recognized testing organization.

(5) General alarm system fuse capacities shall be selected to obtain as wide a differential as possible between branch circuit fuses and feeder fuses. The capacity of a feeder fuse shall be approximately 200 percent of the load supplied, and the capacity of a branch circuit fuse shall not exceed 50 percent of the capacity of the feeder fuse.

§ 113.25–20 Marking of equipment.

(a) Each general alarm system fused switch and distribution panel shall be provided with a permanent nameplate on the outside of the door describing its function. The rating of fuses shall also be indicated for fused switches.

(b) The general alarm contact maker shall be marked with lettering on a corrosion-resistant plate or with a sign in red letters on a suitable background "GENERAL ALARM."

(c) A contact maker to operate only the general alarm bells in crew quarters, machinery and work spaces shall be marked as described in paragraph (b) of this section, except with the words "CREW ALARM."

(d) General alarm bells shall be marked in not less than ½-inch red letters "GENERAL ALARM—WHEN BELL RINGS GO TO YOUR STATION."

(e) Each general alarm system distribution panel shall be provided with a directory attached to the inside of the cover giving the designation of each circuit, the area supplied by each circuit, and the rating of all circuit fuses.

CROSS REFERENCES: See also §§ 78.47–5 and 78.47–7 of Subchapter H (Passenger Vessels) and §§ 97.37–5 and 97.37–7 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

§ 113.25–25 General alarm system for manned ocean and coastwise barges.

(a) Each manned ocean and coastwise barge of over 100 gross tons, where the crew is divided into watches for the purpose of steering the vessel, shall be provided with a suitable alarm bell installation.

§ 113.25–30 General alarm system for barges of 300 gross tons and over with sleeping accommodations for more than 6 persons.

(a) Barges of 300 gross tons and over with sleeping accommodations for more than 6 persons shall be provided with a suitable alarm bell installation.

§ 113.25–90 General alarm system for existing vessels.

(a) All vessels of over 100 gross tons the construction of which was begun on or after September 1, 1943, but prior to November 19, 1952, shall have all sleeping accommodations, public spaces, and

machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants. The system shall operate from a continuous source of electric energy capable of supplying the system for a period of at least 8 hours without being dependent upon the main, auxiliary or emergency generating plants. Each bell shall produce a signal of a tone distinct from that of other bell signals in the vicinity and shall be independently fused with each of these fuses located above the bulkhead deck. The bells shall be controlled by a manually operated contact maker located in the pilothouse, or, if specific approval is given by the Commandant, in the fire control station. The characteristics of the contact maker shall be such that it possesses:

(1) Positive contact;

(2) Watertightness (when located in open spaces subject to weather);

(3) Means whereby its electrically open or closed position can be determined by sense of touch;

(4) Means to effect a make-and-break circuit for signalling; and

(5) Self-maintaining contacts.

(b) All vessels of over 100 gross tons the construction of which was begun prior to September 1, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction as to provide an alarm throughout the spaces for which they are provided.

(c) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.30—Sound Powered Telephone and Voice Tube Systems

§ 113.30–1 Application.

(a) The provisions of this subpart, with the exception of § 113.30–90, shall apply to all self-propelled vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.30–90.

§ 113.30–5 General requirements.

(a) Vessels shall be provided with an efficient means of communication between each of the following:

(1) Wheelhouse;

(2) Engine room;

(3) Steering gear room, if located outside of engine room; and

(4) After steering station, if required.

(b) Vessels equipped with a gyro-compass system shall be provided with an efficient means of communication between the master gyro-compass and the wheelhouse repeater compass. Whenever the master gyro-compass is located within any compartment adjoining or opening into the wheelhouse, the master gyro-compass shall be considered as being located in the wheelhouse and no communication therewith is required.

(c) Vessels equipped with a radar plan position indicator installation remotely located from the wheelhouse shall be provided with an efficient means of communication between the wheelhouse and the radar plan position indicator.

(d) Where emergency squad equipment is stowed in lockers or spaces remote from the wheelhouse, an efficient means of communication shall be provided between the wheelhouse and the emergency squad equipment stowage space or spaces.

(e) Communication to radio and radio direction-finder shall comply with the requirements of this paragraph. The term "radio installation" shall be construed to mean either the radiotelegraph installation or, where only a radiotelephone is installed, the radiotelephone installation.

(1) Vessels equipped with a radio installation shall be provided with an efficient means of communication between the radio room and the wheel house and one other place, if any, from which the vessel may be navigated under normal conditions, as opposed to other such places established solely for emergency functions, or places used solely for docking or maneuvering, or places used occasionally while navigating the vessel in close quarters. As used in this paragraph only a location which includes the necessary apparatus to steer the vessel, give engine orders, and control the whistle will be considered a place from which the vessel may be navigated.

(i) Where the operating position of the emergency radio installation is not located in the compartment normally used for operating the main radio installation, an efficient means of communication shall be provided between the emergency radio room and the wheel house and one other place, if any, from which the vessel may be navigated under normal conditions, as opposed to other such places established solely for emergency functions, or places used solely for docking or maneuvering, or places used occasionally while navigating the vessel in close quarters.

(2) Vessels equipped with radio direction-finding apparatus shall be provided with an efficient means of communication between the wheelhouse and the direction-finding apparatus.

(i) Whenever the direction-finder receiver is located on the navigating bridge of a ship or within any compartment adjoining or opening onto the wheelhouse of a ship, the direction-finding apparatus shall be considered as being located in the wheelhouse, and no communication is required.

(3) The communication systems required by this paragraph shall be independent of any other system on the ship, and the location of the termination of these systems shall be subject to approval by the Federal Communications Commission.

(f) Vessels equipped with smoke detecting systems contracted for on or after January 1, 1962, where detecting cabinets are not located in the pilothouse shall be provided with an efficient means of direct communication between the pilothouse and the stations where the detecting cabinets are located.

(g) An efficient means of communication shall be provided between the wheelhouse and the bow or forward lookout station. This communication need not be by means of sound powered telephone or voice tube if other suitable means is provided or if the vessel configuration is such that direct voice communication between the wheelhouse and bow or forward lookout station is effective. When a sound powered telephone is installed, the requirements of § 113.30–20(b) are applicable.

§ 113.30–10 Voice tubes, general requirements.

(a) Voice tubes may be employed to comply with the requirements of this subpart where the required length of voice tube as installed will not exceed 125 feet.

(b) Where the length of voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches outside diameter.

(c) Where the length of voice tube as installed is over 75 feet and not over 125 feet, the tube shall be at least 2½ inches outside diameter.

(d) Sound powered telephone equipment may be installed in all cases where voice tube communication is permitted.

§ 113.30–15 Voice tubes, detail requirements.

(a) Voice tubes and voice tube fittings shall be constructed of brass or other corrosion-resistant material having a wall thickness of approximately 0.042 inch.

(b) Voice tubing shall be run as direct as possible, and the cross-section of the tube shall be constant throughout the run. Any constriction in the tube such as a dent; reducer coupling, sharp elbow, T connection, or any flat surface shall be avoided. Flexible tubes or bends shall be used in place of fittings wherever possible. Joints in tubing shall be protected by a close fitting sleeve and the joint soldered or filled with white lead.

(c) Voice tubes shall be supported at least every 8 feet on straight runs and at bends as required.

(d) Voice tubes shall be protected where liable to injury and shall not be run in bunkers, cargo spaces, or through machinery spaces unless unavoidable.

(e) Voice tubes shall be provided with drain plugs at the bottom of each vertical run and at all other places where water can collect.

(f) Each voice tube shall be terminated at each end by a suitable mouthpiece with a whistle indicator. Watertight mouthpieces shall be used in locations exposed to the weather.

(g) All voice tubes shall be provided with designating nameplates.

§ 113.30–20 Sound powered telephone system, general requirements.

(a) Where a voice tube installation would require a length of the tube exceeding 125 feet or where for other reasons efficient communication cannot be obtained by a voice tube installation, approved sound powered telephone equipment shall be installed as the means of communication required by this subpart.

(b) The telephone stations listed in § 113.30–5 (a) through (d), (f), and (g) may be installed on the same circuit. However, when included on the same circuit with other required stations, the bow or forward lookout telephone must be provided with a wheelhouse cut-out switch if the telephone is located in the weather. Other stations which are desirable for the operation of the vessel, such as captain's and chief engineer's office and stateroom, emergency power room, CO_2 control room, fire pumproom, etc., will be considered for inclusion on this circuit.

(c) Sound powered telephone systems may, in all cases, be installed in lieu of voice tube systems.

(d) Except as provided in paragraph (b) of this section, telephone stations not specifically required by this subpart which are located in the weather shall not be included on a telephone circuit which includes any of the required telephone stations.

(e) Jack boxes or headsets shall not be utilized on a telephone installation that includes any of the stations required by this subpart.

§ 113.30–25 Sound powered telephone system, detail requirements.

(a) Sound powered telephone equipment used on a telephone circuit that includes any of the stations required by this subpart shall be of a type approved by the Commandant.

(b) Sound powered telephone stations installed in locations exposed to the weather shall be of watertight construction, and the audible signal shall be mounted external to the station enclosure.

(c) Sound powered telephone stations installed in wheelhouse or machinery spaces shall be of at least drip-proof construction.

(d) In noisy locations, a telephone booth or other suitable auxiliary equipment shall be provided if necessary in order that a telephone conversation can be carried on while the vessel is being navigated.

(e) In noisy locations where the magneto-operated telephone station sound signal cannot be heard throughout the space, the sound signal shall be supplemented by an additional sound signal energized from the vessel's electrical system and magneto actuated. This supplementary sound signal shall not be combined with any other signal or alarm system, such as an engineers' signal and alarm panel.

(f) When two or more telephone stations are located in close proximity to each other, a suitable means shall be provided to indicate the station called.

(g) The sound powered telephone talking circuit shall be electrically independent of the calling circuits. A short circuit, open circuit, or ground on either side of the calling circuit shall not affect the talking circuit in any way. All circuits shall be insulated from ground.

(h) Sound powered telephone circuits shall be run in leaded and armored, impervious sheathed and armored or mineral-insulated metal sheathed cable. All connection boxes employed shall be watertight.

(i) Telephone cables shall be run as close to the fore and aft centerline of the vessel as is practicable and through runs of cable should avoid such spaces as machinery room and galleys.

§ 113.30–90 Sound powered telephone and voice tube systems for existing vessels.

(a) Vessels contracted for prior to November 19, 1952, shall meet the requirements contained in this section.

(b) Except as otherwise required by paragraph (d) of this section, existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.35—Engine Order Telegraph Systems

§ 113.35–1 Application.

(a) The provisions of this subpart, with the exception of § 113.35–90, shall apply to all self-propelled vessels contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.35–90.

§ 113.35–5 General requirements.

(a) All vessels, except as otherwise provided for in this section, shall have installed an efficient means for transmitting engine orders from the wheelhouse to the engine room and of transmitting acknowledgment of engine orders from the engine room to the wheelhouse.

(1) On vessels with more than one propulsion engine, this efficient means of transmitting engine orders shall be provided for each engine.

(2) On double-ended vessels with two wheelhouses, this efficient means of transmitting engine orders shall be provided between the engine room and each wheelhouse.

(3) On vessels provided with a means of steering from the top of the wheelhouse as well as from the wheelhouse, this efficient means of transmitting engine orders shall also be provided between the engine room and the top of the wheelhouse.

(b) The efficient means of transmitting engine orders may be of the engine gong and sound tube type, the mechanical engine order telegraph type, the electric engine order telegraph type, or other types as may be approved.

(c) Small vessels on which the propulsion plant is controlled entirely from the wheelhouse with no means of normal engine control from the engine room, need not be provided with an engine order telegraph system between the wheelhouse and the engine room.

§ 113.35–10 Engine gong systems, general requirements.

(a) An engine gong system shall consist of pull handles located in the wheelhouse mechanically connected by wires and chains to gongs located in the engine room.

(1) A sound tube of proper size shall be run between the wheelhouse and the engine room and so arranged as to return the sound of the gong signals to the wheelhouse.

(2) A speaking tube or other device for the purpose of conversation between the wheelhouse and the engine room shall also be provided.

(b) The sound tube and the speaking tube shall comply with the requirements of § 113.30–15 except that the sound tube shall be terminated by a flared sounder in lieu of whistle mouthpieces and the sound tube size shall be not less than 2½ inches outside diameter.

(c) The engine room gong and the termination of the sound tube and the speaking tube in the engine room shall be at the engine control station.

(d) The gong pull installation shall comply with the applicable requirements of § 113.35–25.

§ 113.35–15 Engine gong systems, application.

(a) Engine gong systems shall not be employed on vessels where the length of sound tube as installed will exceed 40 feet.

§ 113.35–20 Mechanical engine order telegraph systems, general requirements.

(a) Mechanical engine order telegraph systems shall consist of transmitters and indicators mechanically connected to each other by means of chains and wires.

(b) Transmitters and indicators shall be provided with dials divided into sectors or divisions with the various engine orders engraved thereon.

(c) Rotation of the transmitter handle and its associated pointer shall drive the indicator pointer in synchronism. The indicator pointer, always having the same angular position as the transmitter handle and its associated pointer, shall point to the order corresponding to the order on the transmitter.

(d) The engine room indicator shall be equipped with a reply handle and associated pointer driving a reply pointer in the wheelhouse transmitter for acknowledgement of orders.

(e) Each transmitter and each indicator shall be provided with an audible signal device to indicate, in the case of an indicator, the receipt of an order and, in the case of a transmitter, the acknowledgement of an order. The audible

signal device shall not be dependent upon any source of power for operation other than that of the movement of the transmitter or indicator handle.

(f) The dials of transmitter instruments shall be illuminated in such a manner as not to interfere with navigating the vessel at night.

(g) Transmitter and indicator operating handles shall be of substantial size so that engine orders may be determined from a distance.

§ 113.35–25 Mechanical engine order telegraph systems, detail requirements.

(a) Telegraph wire shall be No. 10 Stubs Gage (0.134 inch diameter) soft brass wire and shall be stretched approximately 20 percent before installation.

(b) Pulleys shall be provided wherever a bend in the run of the telegraph wire is made, and at each pulley sheave a length of brass telegraph chain shall be employed.

(c) Pulleys shall be in line with the wire and chain.

(d) Turnbuckles shall be provided in each lead at each instrument to adjust the handles and pointers to the central position of the order, and shall be provided at other locations throughout the system as necessary to take up slack in the lead wires and to center the chains at the pulleys.

(e) Where telegraph leads pass through watertight decks or bulkheads, stuffing tubes shall be employed.

(f) On long horizontal runs, the telegraph wire shall be supported on roller bearers at approximately every 5 feet of run. When telegraph leads are run behind sheathing or when subject to mechanical damage, the leads shall be run "in pipe."

(g) All fittings used in telegraph installations shall be constructed of brass, bronze, or other corrosion-resistant materials.

(h) Positive locking devices, such as keys, shall be used in securing handles and similar parts to their associated shafts to ensure continuous operation of the shaft in response to movement of the handle.

(i) Transmitter dials shall be arranged with the "STOP" order at the top vertical position of the operating handle. On ahead orders the operating handle shall be moved toward the bow of the vessel and on astern orders the operating handle shall be moved toward the stern of the vessel.

(j) Indicator dials shall be arranged as specified for transmitter dials except that the "STOP" order shall be at the bottom vertical position of the reply handle.

(l) Indicator dials on double-ended vessels shall not be marked with the designations "AHEAD" and "ASTERN," but the reply handle and indicator arrow shall point in the direction in which it is desired that the engine operate.

§ 113.35–30 Mechanical engine order telegraph systems, operation.

(a) Where more than one transmitter, located in the wheelhouse, the wings of the navigating bridge, and/or the top of the wheelhouse, operate a common indicator in the engine room, all the transmitters shall be mechanically interlocked and operate in synchronism. The method of mechanical interlocking shall be such that a failure of the transmission wire or chain at any transmitter located topside will not interrupt or disable other topside transmitters.

§ 113.35–35 Mechanical engine order telegraph systems, application.

(a) Mechanical engine order telegraph systems may be installed on all vessels to provide the communication required by this subpart where the length of cables or other mechanical limitations will not prevent the efficient operation of the system.

§ 113.35–40 Electric engine order telegraph systems, general requirements.

(a) Electric engine order telegraph systems shall consist of transmitters and indicators electrically connected to each other.

(b) Transmitters and indicators shall be provided with dials divided into sectors or divisions with the various engine orders engraved thereon.

(c) Rotation of the transmitter handle and its associated pointer shall drive the indicator pointer in synchronism. The indicator pointer, always having the same angular position as the transmitter handle, shall point to the order corresponding to the order on the transmitter.

(d) For acknowledgment of orders, the engine room indicator shall be equipped with a handle and generator actuating a motor and pointer on the transmitter, similar to the facilities provided for transmitting orders.

(e) Audible signals associated with the system shall consist of a vibrating bell at each instrument. The vibrating bell at both transmitter and indicator shall ring continuously at all times when the transmitter arrow and the reply arrow do not point to the same order.

(f) The dials of transmitter instruments shall be illuminated in such a manner as not to interfere with navigating the vessel at night.

(g) Transmitter and indicator operating handles shall be of substantial size so that the engine order may be determined from a distance.

§ 113.35–45 Electric engine order telegraph systems, detail requirements.

(a) Telegraph instruments shall form watertight enclosures for the electrical components.

(b) Materials used in the construction of telegraph instruments shall be corrosion-resistant.

(c) Transmitter dials shall be in accordance with § 113.35–25 (i). Indicator dials shall be in accordance with § 113.35–25 (j) except that the "STOP" order may be at the bottom or top vertical position of the reply handle to suit bulkhead or pedestal mounted instruments, respectively.

(d) Electric cable used in conjunction with electric telegraphs shall be leaded and armored, impervious sheathed and armored or mineral-insulated metal sheathed and all connection boxes shall be of watertight construction.

(e) Each system shall be provided with an alarm device which automatically sounds audibly and indicates visually in the event of loss of potential to the system.

(1) This alarm device shall be located in the wheelhouse.

(2) Means shall be provided to silence the audible signal.

(3) Where the supervisory power supply is a dry cell battery or some other low capacity source, there shall be no electric drain on the supervisory power supply after the audible signal has been silenced; the visible indication may be extinguished to effect this. Upon reestablishment of potential to the telegraph system, the audible signal shall sound again until the alarm circuit is returned to normal unless restoration of this alarm circuit is effected automatically.

§ 113.35–50 Electric engine order telegraph system, operation.

(a) Where more than one transmitter, located in the wheelhouse, the wings of the navigating bridge, and/or the top of the wheelhouse, operate a common indicator in the engine room, either the transmitters shall operate in synchronism in accordance with paragraph (b) of this section, or the transmitters shall operate under the control of a transmitter transfer control in accordance with paragraph (c) of this section.

(b) All transmitter handles and pointers and all reply pointers shall operate in synchronism. Where the transmitters are mechanically interlocked to effect synchronous operation, the requirements of § 113.35–30(a) shall be met.

(c) All transmitters shall operate under the control of a transmitter transfer control so that movement of any one transmitter handle automatically connects that instrument electrically to the engine room indicator and simultaneously disconnects electrically all other transmitters. The reply pointers of all transmitters shall operate in synchronism at all times.

§ 113.35–55 Electric engine order telegraph systems, application.

(a) Electric engine order telegraph systems may be installed on all vessels to provide the communication required by this subpart, except that passenger vessels of 20,000 gross tons or over equipped with an electric engine order telegraph system shall be provided with a stand-by system, either electrical or mechanical.

§ 113.35–90 Engine order telegraph systems for existing vessels.

(a) The engine order telegraph installations on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the

same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.40—Rudder Angle Indicator Systems

§ 113.40–1 Application.

(a) The provisions of this subpart, with the exception of § 113.40–90 shall apply to all self-propelled vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.40–90.

§ 113.40–5 General requirements.

(a) The exact position of the rudder, if power operated, shall be indicated at the principal steering station. When non-follow-up steering control is installed at the after steering station, a separate rudder angle indicator system shall be installed for that station. See Part 57 of Subchapter F (Marine Engineering) of this chapter.

§ 113.40–10 Detail requirements.

(a) The rudder angle indicator system shall consist of a transmitter located at the rudder head and actuated by movement of the rudder, the angular movements of the rudder being transmitted to a remote indicator(s).

(b) The indicator instrument shall consist of a fixed dial with angular positions of the rudder right and left of an amidship position indicated thereon. Indications of rudder angle shall be by means of a moving pointer.

(1) The movement of the indicator pointer shall be consistent with the movement of the steering wheel or control.

(c) The indicator(s) shall be located in direct line of vision of the helmsman and shall be provided with dial illumination in such a manner as not to interfere with navigating the vessel at night.

(d) The method of transmitting rudder movement between the transmitter and the indicator(s) may be either by self-synchronous generator and motor(s), by mechanical telegraphs, or by other equivalent means.

(e) The electric rudder angle indicator system shall comply with the applicable requirements of §§ 113.35–40 and 113.35–45 (a) to (d), inclusive.

(f) Mechanical methods of transmitting rudder angles shall be in accordance with approved installation drawings submitted for each installation.

§ 113.40–90 Rudder angle indicator systems for existing vessels.

(a) Rudder angle indicator systems on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.45—Refrigerated Spaces Alarm Systems

§ 113.45–1 Application.

(a) The provisions of this subpart, with the exception of § 113.45–90, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of § 113.45–90 shall apply to all vessels contracted for prior to November 19, 1952.

§ 113.45–5 General requirements.

(a) Each refrigerated space accessible to ship's personnel during a voyage and which can be so locked from the outside that it cannot be opened from the inside, shall be fitted with an alarm system operated from within each refrigerated space.

(b) The alarm system may be either a mechanical pull operating a jingle bell or an electrical push button operating a vibrating bell or other audible device.

(c) The mechanical pull or electrical push button shall be located at the exit from the refrigerated compartment.

(d) The audible signal shall be located where a person is regularly employed.

(e) Where a common audible signal is provided for more than one lockable refrigerated compartment, an annunciator shall be provided to locate the compartment from which the signal was initiated.

§ 113.45–90 Refrigerated spaces alarm systems on existing vessels.

(a) Refrigerated spaces alarm systems on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.50—Emergency Loudspeaker System

§ 113.50–1 Application.

(a) The provisions of this subpart, with the exception of § 113.50–90, shall apply to all ocean and coastwise passenger vessels contracted for on or after November 19, 1952. Ocean and coastwise vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.50–90.

§ 113.50–5 General requirements.

(a) All ocean and coastwise passenger vessels certificated to carry 500 or more persons, including officers and crew, and/or all passenger vessels whose lifeboats are stowed more than 100 feet from the navigating bridge, shall be equipped with an approved loudspeaker system which will enable an officer on the bridge to broadcast separately or collectively to the stations listed in this paragraph.

(1) Lifeboat stations, port.

(2) Lifeboat stations, starboard.

(3) Lifeboat embarkation stations, port.

(4) Lifeboat embarkation stations, starboard.

(5) Public spaces used for passenger assembly stations.

(6) Crew quarters.

(b) The system shall be controlled from a single location on the navigating bridge.

(c) Loudspeakers, as designated by the Commandant, at lifeboat and embarkation stations shall be arranged for two-way conversation with the navigating bridge.

(d) The emergency loudspeaker system shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1958, shall meet the requirements of Subpart 161.004 of Subchapter Q (Specifications) of this chapter.

§ 113.50–10 Power supply.

(a) The loudspeaker system shall be energized from the source of emergency lighting and power as required by Subpart 112.15 of this subchapter.

(b) Where the loudspeaker system requires a power supply of a character different from that available from the temporary source of emergency lighting and power, conversion equipment as required by Subpart 112.40 of this subchapter shall be provided.

§ 113.50–15 Location of loudspeakers and amplifiers.

(a) *General.* (1) Loudspeakers shall be located with due regard to the intended service and to minimize as much as possible the effect of feedback and other interference.

(2) In general, loudspeakers on open decks shall be directed toward the after end of the vessel and outboard by an angle of approximately 15 degrees.

(b) *Boat deck loudspeakers.* (1) A loudspeaker shall be located at each lifeboat handling station. The axis of the loudspeaker shall be directed aft and outboard in such a manner that the sound level at the lifeboat handling station will be not less than the levels given in Table 113.50–15.

(c) *Lifeboat embarkation and passenger assembly station loudspeakers.* (1) Loudspeakers shall be distributed throughout the lifeboat embarkation deck and locations designated by the vessel's station bill for the assembly of passengers in an emergency, in such number as to provide an even distribution of sound at a level not less than that specified in Table 113.50–15. An even

distribution of sound level is considered satisfied if the variation does not exceed plus or minus 3 decibels.

(d) *Crew quarters' loudspeakers.* (1) Loudspeakers shall be distributed in passageways throughout crew quarters in such number as to provide a sound level not less than that specified in Table 113.50–15 in each room with the doors closed.

(e) *Amplifier.* (1) The emergency loudspeaker amplifier, if not located in the same enclosure with the control panel, shall be located in the wheelhouse or in a compartment adjoining or opening into the wheelhouse.

TABLE 113.50–15—MINIMUM SOUND LEVEL REQUIREMENTS FOR LOUDSPEAKER SYSTEMS

[All data given in decibels] [1]

Location	Ground noise level minimum	Signal level		Voice level	
		Above ground noise	Total	Above ground noise	Total
Lifeboat stations	80	20	[3] 100	15	[3] 95
Embarkation deck and exterior passenger assembly points	80	20	[3] 100	15	[3] 95
Interior passenger assembly points	75	20	[3] 95	15	[3] 90
Crew quarters	60	18	[3] 78	12	[3] 72

[1] The zero decibel level shall be 0.0002 dyne per square centimeter.

[2] Measured at a distance of 10 feet from the loudspeaker and on the axis thereof.

[3] Measured in rooms with the doors to the passageways closed.

§ 113.50–20 Distribution of cable runs.

(a) Cable runs to the different loudspeaker groups shall be as widely separated from each other as possible to limit the extent of damage to the system from a single casualty. In addition, the distribution shall be such that a casualty to the port or starboard supplies to loudspeakers on boat and embarkation decks will render not more than half of the loudspeakers in the group inoperative. This may be accomplished by feeding the loudspeakers of a particular group alternately from a port and starboard multiconductor cable.

(b) Cable runs shall, where possible, be located in passageways and shall avoid staterooms, lockers, and other enclosed spaces.

§ 113.50–25 Type of cable and equipment enclosures.

(a) All cable used in connection with the system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(b) All junction or connection boxes employed in the distribution system shall be of watertight construction.

§ 113.50–30 Shipboard tests.

(a) The operation of the system shall be observed to determine that voice reproduction is of good quality and intelligibility of a high order.

(b) Sound levels shall be measured with a sound level meter to demonstrate that the levels listed in Table 113.50–15 are met.

(1) Where the ground noise level with the vessel under way in moderate weather is in excess of the values listed in Table 113.50–15, the signal and voice levels shall be increased correspondingly so that the differential between ground noise level and the signal and voice levels shall be not less than the differential given in this table.

(c) It shall be demonstrated that grounding either conductor or "shorting" both conductors to any one lifeboat station loudspeaker, or to an embarkation deck loudspeaker, will not reduce the output of any one of the remaining loudspeakers by more than 3 decibels.

§ 113.50–35 Operation of emergency loudspeaker systems.

(a) The emergency loudspeaker system shall be used at the discretion of the master and shall function entirely independently of any public address or music distribution system.

(b) The emergency loudspeaker system shall not be used for entertainment purposes.

(c) The complete emergency loudspeaker system shall be given an operating test at least once every week. These tests shall be made by a licensed officer and the condition of the equipment entered in the vessel's log.

(d) When a vessel is equipped with a public address or music distribution system, means shall be provided adjacent to the emergency loudspeaker system control panel to silence the public address or music distribution systems.

§ 113.50–90 Emergency loudspeaker systems for existing vessels.

(a) *Existing vessels.* Emergency loudspeaker systems on ocean and coastwise passenger vessels contracted for prior to November 19, 1952, shall meet the requirements of this section.

(b) *General requirements.* (1) All passenger vessels the construction of which was begun prior to January 1, 1937, on which lifeboats are stowed more than 100 feet from the navigating bridge, and all passenger vessels the construction of which was begun prior to November 19, 1952, but on and after January 1, 1937, certificated to carry 1,000 persons or more, including officers and crew, shall be equipped with a loudspeaker system which shall enable an officer on the bridge to broadcast separately or collectively to the stations listed in this subparagraph.

(i) Lifeboat stations, port and starboard. (The deck or decks on which lifeboats are stowed and from which they are launched.)

(ii) Embarkation deck, port and starboard. (The deck or decks, designated by construction design or by the vessel's station bill, used for the embarkation of passengers and crew into lifeboats. If lifeboat stations are used for embarkation purposes, this requirement will be omitted.)

(iii) Main quarters for crew. (The quarters of the emergency squad, deck crew, and stewards assigned to passenger quarters.)

(iv) Public spaces. (The spaces designated by the vessel's station bill where passengers and crew are to assemble in an emergency.)

(2) The Commandant may, in special cases, exempt passenger vessels the construction of which was begun prior to January 1, 1937, having a small number of especially accessible lifeboats stowed more than 100 feet from the bridge: *Provided, however,* That no such vessel certificated to carry more than 200 persons, including officers and crew, shall be so exempted.

(3) Details of the system shall be in general agreement with §§ 113.50–5 through 113.50–35 insofar as is reasonable and practicable.

(4) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in §§ 113.50–5 through 113.50–35, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation provided that, in no case, will a greater departure from the standards of §§113.50–5 through 113.50–35 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements, for new vessels.

Subpart 113.55—Navigation Lights

§ 113.55–1 Application.

(a) The provisions of this subpart, with the exception of § 113.55–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.55–90.

§ 113.55–5 General requirements.

(a) All vessels and motorboats shall be equipped with navigation lights and shapes as prescribed by law and regulation.

§ 113.55–10 Construction of navigation lights.

(a) Navigation lights shall be of an approved type.

§ 113.55–15 Installation of navigation lights.

(a) Navigation lights shall be installed in such a manner that the angles of visibility and the minimum heights above the deck required by the applicable Rules of the Road will be assured.

(b) The light from a navigation light shall not be obscured by any part of the vessel's structure or rigging.

(c) Navigation lights shall be wired by means of a short length of heavy duty portable cable to a watertight receptacle outlet located adjacent thereto. Where the double lens, two-lamp type electric navigation light is installed, each lamp shall be connected to its branch circuit conductors by means of an individual portable cable and receptacle plug.

§ 113.55–20 Light screens.

(a) Light screens required by the Rules of the Road for port and starboard side lights shall be painted with a glossy black paint and shall project not less than three feet forward of the center of the light source.

§ 113.55–25 Navigation light indicator panel.

(a) Self-propelled vessels of 1,600 gross tons and over shall be provided with a navigation light indicator panel located in the wheelhouse to control electric side, masthead, range, and stern lights. The panel shall provide visible and audible indications of the failure of any of the above named navigation lights.

(b) Recommended circuit diagrams for navigation light indicator panels are shown in Figure 113.55–25 (b). Other circuit diagrams may be submitted for approval.

§ 113.55–90 Navigation lights for existing vessels.

(a) Navigation lights on vessels contracted for prior to November 19, 1952, shall meet the requirements covered in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Office in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements.

Subpart 113.60—Signaling Lights

§ 113.60–1 Application.

(a) The provisions of this subpart, with the exception of § 113.60–90, shall apply to vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.60–90.

§ 113.60–5 General requirements.

(a) Except as modified by § 33.50–1 of Subchapter D (Tank Vessels) of this chapter, all ocean and coastwise self-propelled vessels of over 150 gross tons shall be equipped with an efficient daylight signaling light of the type covered by this subpart.

§ 113.60–10 Detail requirements.

(a) The signaling light shall consist of a device which produces a narrow high-intensity beam of light suitable for daylight blinker communication at speeds up to 9 words (180 dots and/or dashes) per minute.

(b) The axial candlepower of the beam shall be not less than 60,000 candlepower. The beam shall have a total horizontal and vertical divergence of approximately 6 degrees. This divergence is defined as the angular limits of the beam where the candlepower has fallen to one-tenth of the axial candlepower.

(c) In addition to the requirements of paragraph (b) of this section, the candlepower of the beam in every direction within an angle of 0.7 degree from the axial shall not be less than 50 percent of the axial candlepower.

(d) The signaling light shall be fitted with a suitable sighting arrangement capable of directing the beam on to the receiving station.

(e) Signaling may be effected by keying the current through the lamp, by movement of shutters, or by other approved means.

(f) The signaling light may be either a fixed unit mounted on the top of the wheelhouse, a semi-fixed unit with arrangements for quick mounting at either wing of the navigating bridge, or a portable unit.

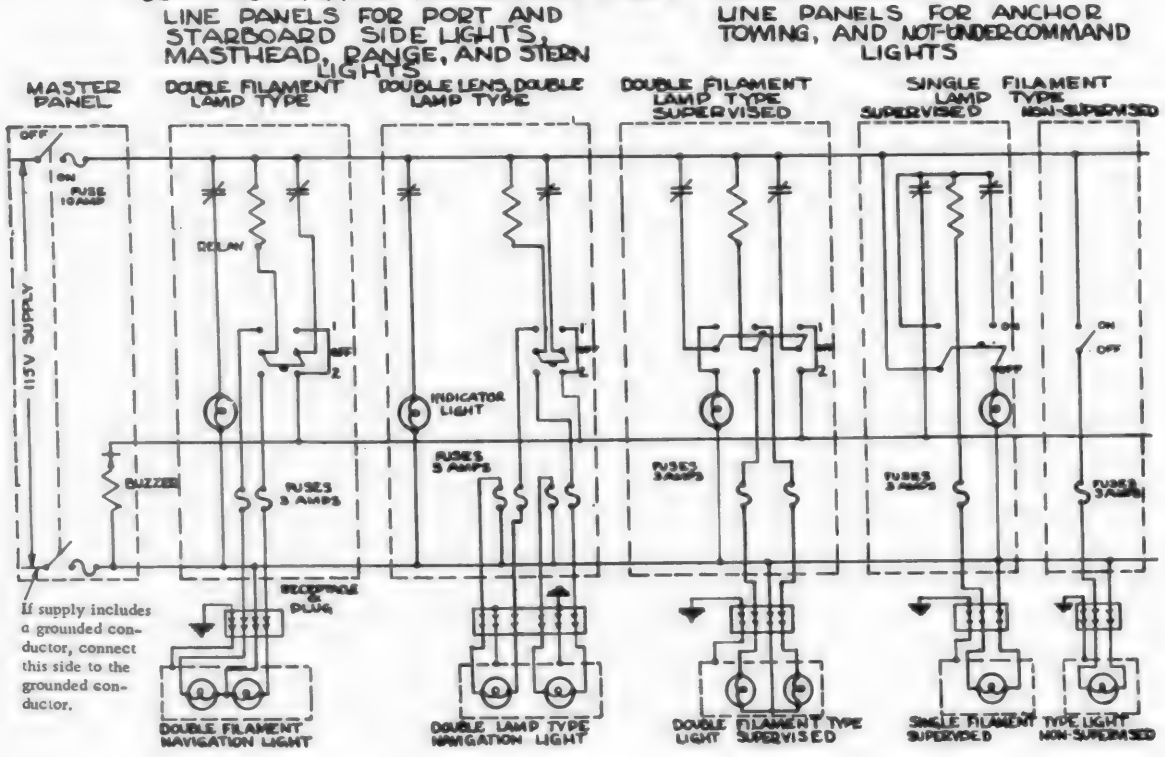
(g) Fixed or semifixed signaling lights shall be energized from the emergency lighting and power system as required by § 112.15–5(h) of this subchapter. Portable signaling units shall be energized from a self-contained storage battery capable of operating the unit 2 hours continuously without recharging.

§ 113.60–90 Signaling light for existing vessels.

(a) Signaling lights on vessels contracted for prior to November 19, 1952,

FIGURE 113.55-25(b)

SEMI-AUTOMATIC NAVIGATION LIGHT PANEL CIRCUITS


LINE PANELS FOR PORT AND STARBOARD SIDE LIGHTS, MASTHEAD, RANGE, AND STERN LIGHTS
LINE PANELS FOR ANCHOR TOWING, AND NOT-UNDER-COMMAND LIGHTS
MASTER PANEL
DOUBLE FILAMENT LAMP TYPE
DOUBLE LENS, DOUBLE LAMP TYPE
DOUBLE FILAMENT LAMP TYPE SUPERVISED
SINGLE FILAMENT LAMP SUPERVISED
SINGLE FILAMENT TYPE NON-SUPERVISED
OFF
ON
FUSE 10 AMP
115V SUPPLY
DELAY
INDICATOR LIGHT
BUZZER
FUSES 3 AMPS
RECEPTACLE & PLUG
If supply includes a grounded conductor, connect this side to the grounded conductor.
DOUBLE FILAMENT NAVIGATION LIGHT
DOUBLE LAMP TYPE NAVIGATION LIGHT
DOUBLE FILAMENT TYPE SUPERVISED
SINGLE FILAMENT TYPE SUPERVISED
SINGLE FILAMENT TYPE LIGHT NON-SUPERVISED

shall meet the requirements in this section.

(b) Ocean and coastwise ships over 150 gross tons shall be equipped with an efficient signaling lamp. This lamp shall be permanently fixed above the bridge and equipped with a Fresnel lens and high-speed bulb, operated by a weatherproof key, fitted with a suitable condenser. The lamp shall be so connected that it can be operated from the normal source of ship's current, the emergency source, and other emergency batteries if provided.

(c) Existing arrangements, materials, and facilities previously approved will be considered satisfactory as long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.65—Whistle Operators

§ 113.65–1 Application.

(a) The provisions of this subpart, with the exception of § 113.65–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.65–90.

§ 113.65–5 General requirements.

(a) The general requirements for whistles, sirens and foghorns are contained in Part 26 of Subchapter C (Uninspected Vessels), Part 32 of Subchapter D (Tank Vessels), Part 77 of Subchapter H (Passenger Vessels), and Part 96 of Subchapter I (Cargo and Miscellaneous Vessels), of this chapter.

(b) Mechanical whistle or siren pull leads shall be as direct as possible and amply protected. When the leads are suspended for more than 15 feet, they should be supported from a corrosion-resistant cable with suitable bearers. The system shall be provided with ample corrosion-resistant springs to relieve all weight on the lever and for the proper functioning of the system.

(c) Materials and mechanical details shall be in general accordance with the requirements for mechanical telegraphs given in § 113.35–25 except that bronze or stainless steel aircraft type wire rope or other means specifically approved may be used in lieu of the brass wire specified.

(d) When electrically operated whistles and sirens are installed, all parts shall be independent of the primary system.

(e) When electrically operated valves for whistles or sirens are located more than 5 feet from the whistle, an automatic drain feature for the steam whistle pipe shall be installed.

(f) The supply for an electrically operated whistle or siren shall be from the emergency lighting and power system as required by Part 112 of this chapter.

§ 113.65–90 Whistle operators for existing vessels.

(a) Whistle operators on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.70—Smoke Detector Systems

§ 113.70–1 Application.

(a) Where a smoke detector system is installed, the provisions of this subpart, with the exception of § 113.70–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.70–90.

(b) For the vessels on which a smoke detector system is required, see Part 76 of Subchapter H (Passenger Vessels) of this chapter.

§ 113.70–5 General requirements.

(a) The smoke detector control unit shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1959, shall meet the requirements of Subpart 161.002 of Subchapter Q (Specifications) of this chapter.

(b) All electric cable installed in conjunction with the smoke detector system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(c) Cable runs between the smoke detector control unit and the supply switchboard shall be as direct as possible and shall avoid staterooms, lockers, and other enclosed spaces where the cable could be damaged by a localized fire or by other causes.

§ 113.70–10 Power supply.

(a) On vessels fitted with an automatically started emergency lighting and power system, the smoke detector system shall be supplied by a branch circuit from the emergency switchboard. On vessels fitted with a temporary source of emergency lighting and power, the branch circuit may be connected to the temporary emergency source of supply.

(b) On vessels not fitted with an automatically started emergency lighting and power system, the smoke detector system shall be supplied from a source as approved by the Commandant.

§ 113.70–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in §§ 113.70–5 and 113.70–10, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of §§ 113.70–5 and 113.70–10 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

SUBCHAPTER K—MARINE INVESTIGATIONS AND SUSPENSION AND REVOCATION PROCEEDINGS

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Subpart 136.21—Computation of Time

136.21–1 Computation of time.

Subpart 136.23—Evidence of Criminal Liability

136.23–1 Evidence of criminal liability.

AUTHORITY: The provisions of this Part 136 issued under R.S. 4405, as amended, 4462, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 375, 416, 14 U.S.C. 2, 633. Interpret or apply R.S. 4450, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 93 (e), (f), 63 Stat. 504, secs. 10–13, 18 Stat. 128, as amended, sec. 15, 38 Stat. 1184, as amended, sec. 4, 67 Stat. 462, sec. 3, 68 Stat. 675; 46 U.S.C. 239, 367, 526p, 1333, 390b, 14 U.S.C. 93 (e), (f), 33 U.S.C. 361–364, 365, 43 U.S.C. 1333, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, November 26, 1954, 19 F.R. 8026; 167–15, January 3, 1955, 20 F.R. 840; 167–17, June 29, 1955, 20 F.R. 4976; 67–20, June 18, 1956, 21 F.R. 4894, unless otherwise noted.

Subpart 136.01—Authority and Scope of Regulations

§ 136.01–1 Authority and scope of regulations.

The regulations in this part promulgated pursuant to the provisions of R.S. 4450, as amended (46 U.S.C. 239), shall govern the conduct of investigations relating to:

(a) Marine casualties and accidents; and,

(b) Acts in violation of Title 46, U. S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228–234, 239, 240, 361, 362, 364, 367, 372, 373, 375–382, 384, 385, 390–390g, 391, 391a, 392, 393, 399, 400, 402–416, 435–440, 451–453, 460–463, 464, 467, 470–481, 482, 489–498, or Title 50, U. S. Code, section 198, or any of the regulations issued thereunder; or,

(c) Acts of incompetency or misconduct committed by any licensed officer or holder of a certificate of service when such acts are committed in connection with any marine casualty or accident.

Subpart 136.03—Definitions

§ 136.03–1 Marine casualty or accident.

(a) The term "marine casualty or accident" shall mean any casualty or accident involving any vessel other than public vessels if such casualty or accident occurs upon the navigable waters of the United States, its territories or possessions, or any casualty or accident wherever such casualty or accident may occur involving any United States' vessel which is not a public vessel. (See § 136.03–40 for definition of "Public Vessel.")

(b) A marine casualty or accident shall include any occurrence involving a vessel which results in damage by or to the vessel, its apparel and gear, and/or cargo, or injury or loss of life of any of its crew or passengers; and includes inter alia, collisions, strandings, groundings, founderings, heavy weather damage, fires, explosions, failure of gear and equipment and any other damage which might affect and/or impair the seaworthiness thereof.

§ 136.03–5 Major marine casualty.

A casualty shall be considered a major marine casualty whenever it indicates serious damage to material and results in loss of life or serious injury to crew and/or passengers. A casualty may also be deemed a major marine casualty when the circumstances or unusual conditions thereof are of such a nature that the proper investigation cannot be accomplished solely by an investigating officer.

§ 136.03–10 Party in interest.

The term "party in interest" shall mean any person whom the Marine Board of Investigation or the investigating officer shall find to have a direct interest in the investigation conducted by it and shall include an owner, a charterer, or the agent of such owner or charterer of the vessel or vessels involved in the marine casualty or accident, and all licensed or certificated personnel whose conduct, whether or not involved in a marine casualty or accident is under investigation by the Board or investigating officer.

§ 136.03–15 Commandant.

The Commandant, U.S. Coast Guard, is that officer who acts as chief of the Coast Guard and is charged with the administration of the Coast Guard.

§ 136.03–20 Coast Guard district.

A Coast Guard district is one of the geographical areas whose boundaries are described in 33 CFR Part 3.

§ 136.03–25 District Commander.

The District Commander is the chief of a Coast Guard district and is charged with the administration of all Coast Guard responsibilities and activities within his respective district, except those functions of examiners under the Administrative Procedure Act (60 Stat. 237, 5 U. S. C. 1001 et seq.) and activities of independent units of the Coast Guard, such as the Coast Guard Yard and the Coast Guard Academy.

§ 136.03–30 Investigating officer.

An investigating officer is an officer or employee of the Coast Guard designated by the Commandant or the District Commander for the purpose of making investigations of marine casualties and accidents or other matters pertaining to the conduct of seamen.

§ 136.03–40 Public vessels.

Vessels within the statutory exemptions of Title LII of the Revised Statutes of the United States (R.S. 4399–4500) (as amended) relating to the inspection of vessels, are public vessels, and therefore not subject to the regulations in this part. To be deemed public vessels such vessels must:

(a) Be used for a public purpose, not in trade or commercial service; and,

(b) Be owned outright by the United States; it is not sufficient that the United States holds the vessel under a bareboat charter.

Subpart 136.05—Notice of Marine Casualty and Voyage Records

§ 136.05–1 Notice of marine casualty.

The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the Coast Guard whenever the casualty results in any of the following:

(a) Actual physical damage to property in excess of $1500.00;

(b) Material damage affecting the seaworthiness or efficiency of a vessel;

(c) Stranding or grounding;

(d) Loss of life; or,

(e) Injury causing any persons to remain incapacitated for a period in excess of 72 hours; except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

§ 136.05–5 Substance of marine casualty notice.

The notice required in § 136.05–1 shall show the name and official number of the vessel involved, the owner or agent thereof, and insofar as is practicable, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to personnel and the damage to property.

§ 136.05–10 Report by officer in charge of vessel in person.

(a) In addition to the notice required by § 136.05–1, the person in charge of the vessel shall, as soon as possible report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival: *Provided,* That when from distance it may be inconvenient to report in person it may be done in writing only. The written report required for personal accident shall be made on Form CG–924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG–2692.

(b) If filed without delay, the Form CG–924E or CG–2692 may also provide the notice required by § 136.05–1.

(Secs. 13, 17, 54 Stat. 166, as amended, 46 U.S.C. 526*l*(c))

§ 136.05–15 Voyage records, retention of.

(a) The owner, agent, master, or person in charge of any vessel involved in a marine casualty shall retain such voyage records as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyro records, stowage plans, records of draft, aids to mariners, night order books, radiograms sent and received, radio logs, crew and passenger lists, articles of shipment, official logs and other material which might be of assistance in investigating and determining the cause of the casualty. The owner, agent, master, other officer or person responsible for the custody thereof, shall make these records available upon request, to a duly authorized investigating officer, examiner, officer, or employee of the Coast Guard.

(b) The investigating officer may substitute photostatic copies of the voyage records referred to in paragraph (a) of this section when they have served their purpose and return the original records to the owner or owners thereof.

§ 136.05–20 Report of accident to aid to navigation.

Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection. No report on Form CG–2692 is required unless one or more of the results listed in section 136.05–1 occur.

§ 136.05–25 Reports when state of war exists.

During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

Subpart 136.07—Investigations

§ 136.07–1 Commandant or District Commander to order investigation.

(a) The Commandant or District Commander upon receipt of information of a marine casualty or accident, will immediately cause such investigation as may be necessary in accordance with the regulations in this part.

(b) The investigations of marine casualties and accidents and the determinations made are for the purpose of taking appropriate measures for promoting safety of life and property at sea, and are not intended to fix civil or criminal responsibility.

(c) The investigation will determine as closely as possible:

(1) The cause of the accident;

(2) Whether there is evidence that any failure of material (either physical or design) was involved or contributed to the casualty, so that proper recommendations for the prevention of the recurrence of similar casualties may be made;

(3) Whether there is evidence that any act of misconduct, inattention to duty, negligence or willful violation of the law on the part of any licensed or certificated man contributed to the casualty, so that appropriate proceedings against the license or certificate of such person may be recommended and taken under Title 46, U.S. Code, section 239;

(4) Whether there is evidence that any Coast Guard personnel or any representative or employee of any other government agency or any other person caused or contributed to the cause of the casualty; or,

(5) Whether the accident shall be further investigated by a Marine Board of Investigation in accordance with regulations in Subpart 136.09.

§ 136.07–5 Investigating officers, powers of.

(a) An investigation of all marine casualties or accidents reported pursuant to § 136.05–1 will be made by an investigating officer designated by the Commandant or the District Commander.

(b) Such investigating officer shall have the power to administer oaths, subpoena witnesses, require persons having knowledge of the subject matter of the investigation to answer questionnaires and require the production of relevant books, papers, documents and other records.

(c) Attendance of witnesses or the production of books, papers, documents or any other evidence shall be compelled by a similar process as in the United States District Court.

§ 136.07–7 Opening statement.

The investigating officer or the Chairman of a Marine Board of Investigation shall open the investigation by announcing the statutory authority for the proceeding and he shall advise parties in interest concerning their rights to be represented by counsel, to examine and cross-examine witnesses, and to call witnesses in their own behalf.

§ 136.07–10 Report of investigation.

(a) At the conclusion of the investigation the investigating officer shall submit to the Commandant via the Officer in Charge, Marine Inspection, and the District Commander, a full and complete report of the facts as determined by his investigation, together with his opinions and recommendations in the premises. The District Commander shall forward the investigating officer's report to the Commandant with an indorsement stating:

(1) Approval or otherwise of the findings of fact, conclusions and recommendations;

(2) Any action taken with respect to the recommendations;

(3) Whether or not any action has been or will be taken under Part 137 of this subchapter to suspend or revoke licenses or certificates; and,

(4) Whether or not violations of laws or regulations relating to vessels have been reported on Form CG–2636, report of violation of navigation laws.

(b) Investigating officers in foreign ports shall forward their reports directly to the Commandant.

§ 136.07–15 Recommendations, action on.

Where the recommendations of an investigating officer are such that their accomplishment is within the authority of the District Commander or any of the personnel under his command, immediate steps shall be taken to put them into effect and his forwarding endorsement shall so indicate.

§ 136.07–20 Transfer of jurisdiction.

When it appears to the District Commander that it is more advantageous to conduct an investigation in a district other than in the district where the casualty was first reported, that officer shall transfer the case to the other district together with any information or material relative to the casualty he may have.

§ 136.07–25 Testimony of witnesses in other districts, depositions.

When witnesses are available in a district other than the district in which the investigation is being made, testimony or statements shall be taken from witnesses in the other districts by an investigating officer and promptly transmitted to the investigating officer conducting the investigation. Depositions may be taken in the manner prescribed by regulations in Subpart 136.12.

§ 136.07–30 Testimony of witnesses under oath.

(a) Witnesses to marine casualties or accidents appearing before an investigating officer may be placed under oath and their testimony may be reduced to writing.

(b) Written statements and reports submitted as evidence by witnesses shall be sworn to before an officer authorized to administer oaths and such statements and/or reports shall be signed.

§ 136.07–35 Counsel for witnesses and parties in interest.

(a) All parties in interest shall be allowed to be represented by counsel, to examine and cross-examine witnesses and to call witnesses in their own behalf.

(b) Witnesses who are not parties in interest may be assisted by counsel for the purpose of advising such witnesses concerning their rights; however, such counsel will not be permitted to examine or cross-examine other witnesses or otherwise participate in the investigation.

§ 136.07–45 Foreign units of Coast Guard, investigation by.

Investigations of marine casualties conducted by foreign units of the Coast

Guard shall be in accordance with the regulations in this part and all actions taken in connection with the investigations of such marine casualties entered in the official log(s) of the vessel(s) concerned.

§ 136.07–50 Marine Board of Investigation, recommendations for.

When the District Commander is of the opinion, as a result of an investigation under § 136.07–1, or otherwise, that a marine casualty or accident is a major marine casualty (see § 136.03–5), that officer shall immediately inform the Commandant by dispatch with his recommendation whether a further investigation by a Marine Board of Investigation shall be conducted.

§ 136.07–55 Information to be furnished Marine Board of Investigation.

When a Marine Board of Investigation is convened in accordance with §136.09–1, the investigating officer shall immediately furnish the board with all testimony, statements, reports, documents, papers, a list of witnesses including those whom he has examined, other material which he may have gathered, and a statement of any findings of fact which he may have determined. The preliminary investigation shall cease forthwith and the aforementioned material shall become a part of the Marine Board of Investigation's record.

Subpart 136.09—Marine Board of Investigation

§ 136.09–1 Commandant to designate.

If as a result of an investigation of any casualty, upon recommendation of a District Commander or upon receipt of information from any other source, it appears to the Commandant that a marine casualty or accident is a major casualty (see § 136.03–5) and that further investigation thereof would tend to promote safety of life and property at sea and would be in the public interest, the Commandant will designate an appropriate Marine Board of Investigation to conduct such investigation forthwith.

§ 136.09–5 Powers of Marine Board of Investigation.

Any Marine Board of Investigation so designated shall have the power to administer oaths, summon witnesses, require persons having knowledge of the subject matter of the investigation to answer questionnaires, and to require the production of relevant books, papers, documents or any other evidence. Attendance of witnesses or the production of books, papers, documents or any other evidence shall be compelled by a similar process as in the United States District Court. The chairman shall administer all necessary oaths to any witnesses summoned before said Board.

§ 136.09–10 Witnesses, payment of.

Any witness subpoenaed under § 136.09–5 shall be paid such fees for his travel and attendance as shall be certified by the chairman of a Marine Board of Investigation or an investigating officer, in accordance with § 136.11–10.

§ 136.09–15 Time and place of investigation, notice of; rights of witnesses, etc.

Reasonable notice of the time and place of the investigation shall be given to any person whose conduct is or may be under investigation and to any other party in interest. All parties in interest shall be allowed to be represented by counsel, to cross-examine witnesses, and to call witnesses in their own behalf.

§ 136.09–17 Sessions to be public.

(a) All sessions of a Marine Board of Investigation for the purpose of obtaining evidence shall normally be open to the public, subject to the provision that the conduct of any person present shall not be allowed to interfere with the proper and orderly functioning of the Board. Sessions will not be open to the public when evidence of a classified nature or affecting national security is to be received.

§ 136.09–20 Record of proceedings.

The testimony of witnesses shall be transcribed and a complete record of the proceedings of a Marine Board of Investigation shall be kept. At the conclusion of the investigation a written report shall be made containing findings of fact, opinions, and recommendations to the Commandant for his consideration.

§ 136.09–25 U.S. Attorney to be notified.

The recorder of a Marine Board of Investigation shall notify the United States Attorney for the District in which the Marine Board of Investigation is being conducted of the nature of the casualty under investigation and time and place the investigation will be made.

§ 136.09–30 Action on report.

Upon approval of the report of a Marine Board of Investigation the Commandant will require to be placed into effect such recommendations as he may deem necessary for the better improvement and safety of life and property at sea.

§ 136.09–35 Preferment of charges.

(a) If in the course of an investigation by a Marine Board there appears probable cause for the preferment of charges against any licensed or certificated personnel, the Marine Board shall, either during or immediately following the investigation and before the witnesses have dispersed, apprise the District Commander of such evidence for possible action in accordance with Part 137 of this subchapter, without waiting for the approval of the report by the Commandant. Such action or proceedings shall be independent and apart from any other action which may be later ordered by the Commandant or taken by other authorities.

Subpart 136.11—Witnesses and Witness Fees

§ 136.11–1 Employees of vessels controlled by Army or Navy as witnesses.

No officer, seaman, or other employee of any public vessel controlled by the Army or Navy (not including the Coast Guard) of the United States, shall be summoned or otherwise required to appear as a witness in connection wtih any investigation or other proceeding without the consent of the Government agency concerned.

§ 136.11–5 Coercion of witnesses.

Any attempt to coerce any witness or to induce him to testify falsely in connection with a shipping casualty, or to induce any witness to leave the jurisdiction of the United States, is punishable by a fine of $5,000.00 or imprisonment for one year, or both such fine and imprisonment.

§ 136.11–10 Witness fees, subsistence, and mileage.

(a) Duly subpoenaed witnesses, other than Government witnesses, in any investigation or other proceeding may apply for payment for their services as witnesses. Upon the submission of such a request for payment (Standard Form 1157), the chairman of a Marine Board of Investigation or the investigating officer will forward the request to the authorized Coast Guard certifying officer together with a statement that:

(1) The witness seeking payment was duly subpoenaed as a witness by the Coast Guard;

(2) The witness appeared pursuant to such subpoena; and

(3) The witness is entitled to the witness fees, and/or subsistence, and/or mileage claimed.

(b) Upon receipt of such claim (Standard Form 1157) with supporting statement, the Coast Guard authorized certifying officer may certify to the propriety of the claim according to the following scale and submit it to the appropriate disbursing officer for payment:

(1) A fee of $4 for each day or fraction thereof of attendance and for the time necessarily occupied in going to and returning from the investigation or hearing in the case of a witness called to testify as to the facts. A witness called to testify as an expert may be paid a higher fee provided such higher fee is approved by the Commandant prior to his appearance at the investigation or hearing.

(2) A subsistence allowance of $8 for each day or fraction thereof if the witness resides at a distance so far removed from the place at which the investigation, hearing or other proceeding was held as to prohibit his returning to his place of residence each day: *Provided*, That the witness was required to remain at the place at which the investigation, hearing or other proceeding was held for more than one day: *Provided further*, That in the case of employed merchant marine personnel their place of residence will be construed to be the vessel upon which they are employed, and in the case of unemployed merchant marine personnel their place of residence will be construed to be their actual place of residence when ashore, rather than the residence of their next of kin. In cases where subsistence allowance is payable, addditional subsistence allowance of $8 per day may be paid for each day necessarily occupied

in traveling from the place of residence to attend the investigation, hearing or other proceeding hereunder and return to such residence or place. No subsistence allowance for travel time shall be paid if witness is already present at place of investigation, hearing or other proceeding hereunder. In computing the subsistence allowance due a witness the day shall be regarded as beginning on the hour at which it was necessary for the witness to leave his home in order to arrive at the appointed time at the place where the investigation, hearing or other proceeding is held. The witness is to leave the place of investigation, hearing or other proceeding by the first available transportation after his dismissal.

(3) In computing the witness fee or the subsistence allowance, a fraction of a day will be considered as a whole day.

(4) Travel money at the rate of 8 cents per mile, not to exceed 100 miles, for actual travel from place of residence or place where subpoena was served to place at which the investigation, hearing or other proceeding was held. Travel money at the rate of 8 cents per mile, not to exceed 100 miles, is also allowed for the actual travel involved in return of witness to his place of residence, or if the subpoena was served at a place other than the witness's place of residence, to the place where said subpoena was served. All payments of travel money shall be computed on the basis of mileage by the shortest route. When a witness is furnished transportation by the Government no mileage allowance is authorized. If a witness is unable to furnish funds for transportation charges, Government transportation requests may be issued for his transportation, at the lowest first class rate available, to and from the place of investigation, hearing or other proceeding, in which case the mileage allowance is not authorized. When two or more witnesses are transported at the same time in the same privately owned vehicle, operated by one of the witnesses, the mileage allowance for only one witness is authorized.

(5) The fees provided in this section shall not apply in Alaska. In Alaska such witnesses are entitled to the witness fees and mileage prescribed for witnesses before the United States District Court in the judicial division in which the investigation, hearing or other proceeding is held, as set forth in 28 CFR 21.3.

Subpart 136.12—Testimony by Interrogatories and Depositions

§ 136.12–1 Application, procedure, and admissibility.

(a) Witnesses shall be examined orally, except that for good cause shown, testimony may be taken by deposition upon application of any party in interest or upon the initiative of the investigating officer or Marine Board of Investigation.

(b) Applications to take depositions shall be in writing setting forth the reasons why such deposition should be taken, the name and address of the witness, the matters concerning which it is expected the witness will testify, and the time and place proposed for the taking of the deposition. Such application shall be made to an investigating officer or the Marine Board of Investigation prior to or during the course of the proceedings.

(c) The investigating officer or Marine Board of Investigation, shall, upon receipt of the application, if good cause is shown, make and serve upon the parties an order which will specify the name of the witness whose deposition is to be taken, the time and place of the taking of such deposition and shall contain a designation of the officer before whom the witness is to testify. Such deposition may be taken before any officer authorized to administer oaths by the laws of the United States.

(d) The party desiring the deposition may submit a list of interrogatories to be propounded to the absent witness; then the opposite party after he has been allowed a reasonable time for this purpose, may submit a list of cross-interrogatories. If either party objects to any question of the adversary party, the matter shall be presented to the investigating officer or Marine Board of Investigation for a ruling. Upon agreement of the parties on a list of interrogatories and cross-interrogatories (if any) the investigating officer or Marine Board of Investigation may propound such additional questions as may be necessary to clarify the testimony given by the witness.

(e) The subpoena referred to in Subpart 137.15 of this subchapter together with the list of interrogatories and cross-interrogatories (if any) shall be forwarded to the officer designated to take such deposition. This officer will cause the subpoena to be served personally on the witness. After service the subpoena shall be endorsed and returned to the investigating officer or Marine Board of Investigation.

(f) When the deposition has been duly executed it shall be returned to the investigating officer or Marine Board of Investigation. As soon as practicable after the receipt of the deposition the investigating officer or Marine Board of Investigation shall present it to the parties for their examination. The investigating officer or Marine Board of Investigation shall rule on the admissibility of the deposition or any part thereof and of any objection offered by either party thereto.

Subpart 136.13—Disclosure of Records

§ 136.13–1 General.

(a) Upon oral or written inquiry to the Coast Guard, information as to the time, place, and general subject matter of investigations conducted under this part will be released except when such information is held confidential for security reasons. The inquiry should be made to the Officer in Charge, Marine Inspection, who has cognizance of the investigation.

(b) Other information with regard to such investigations which is required to be kept by the Coast Guard will be released only to the extent and under the conditions provided in this subpart.

§ 136.13–5 Applications.

(a) *Form.* The applications for access to and release of information may be made orally except when the regulations in this subpart require a written application for such record. When a written application is required, the application should be addressed to the Officer in Charge, Marine Inspection, or to the person designated as having authority to grant access to or release of information from such records. The written application shall be executed by the parties desiring the information or by any person designated to represent such party as described in § 136.13–10.

(b) *Contents.* The application shall:

(1) Clearly state or describe the information desired;

(2) Identify the applicant, and if the applicant is a representative of another, specify the nature of the representation and attach proof of designation when required;

(3) Set forth the interest of the applicant in the subject matter;

(4) The purpose for which the information is desired; and

(5) Whether or not the information or record sought is intended for use in prosecuting a claim against the United States.

§ 136.13–10 Designation of representatives.

(a) In any case when access to or release of information from any record is permitted to any party by this subpart, the permission shall extend, when such party is deceased or incompetent, to an executor, administrator, heir, guardian, trustee, or legal representative of such party: *Provided,* That the relationship is established by production of satisfactory documentary evidence.

(b) When access to or release of information from any record is sought by one acting as agent or attorney on behalf of any party recognized by regulations in this chapter, the representation as agent or attorney shall be established by the filing with the Officer in Charge, Marine Inspection, documentary proof of such representation. This proof may be in one of the following forms:

(1) A statement of authority in the handwriting of and signed by the party represented; or,

(2) A notarized statement of authority signed by the party represented; or,

(3) A copy of a contract or retainer signed by the party represented.

(c) This authorization shall contain a statement of the specific matters in which representation is authorized.

§ 136.13–15 Casualties involving loss of life.

(a) Records of investigations involving loss of life resulting from marine casualties are public records available for inspection, upon oral or written inquiry.

§ 136.13–20 Casualty investigation records.

(a) Records of investigation conducted by investigating officers pursuant to the provisions of this part, after

action thereon by the District Commander, will be made available to parties in interest before such investigation upon oral or written inquiry. Such records will be made available to persons otherwise properly and directly concerned upon written application to the District Commander or the Officer in Charge, Marine Inspection, having cognizance of such investigation. If extra copies of the records are available, such copies may be furnished to parties in interest.

(b) The records of investigations of marine casualties made by investigating officers, which will be made available to persons properly and directly concerned, shall include notice of casualty or accident, statements and/or testimony of witnesses, exhibits, and any other evidentiary material presented in the investigations, and the findings of fact as determined by the investigating officers, but shall not include the opinions, conclusions, and recommendations of such officers. However, in casualties involving loss of life, the investigating officer's opinions, conclusions and recommendations will be released after final action thereon has been taken by the Commandant.

(c) The District Commander or his representative, upon inquiry, will advise persons properly and directly concerned as to whether or not further action will be recommended or instituted, such as appropriate suspension and revocation proceedings, citation for violation(s) involving fines or penalties, or a recommendation for referral of the record of investigation to the U.S. Department of Justice for further investigation and possible criminal action.

§ 136.13–25 Records of Marine Boards of Investigation.

(a) The record of investigation made by a Marine Board of Investigation will be made available to parties in interest at any stage of the Board's proceedings upon oral or written inquiry to the chairman: *Provided,* That such request does not, in any way, interfere with the proper and orderly functioning of the Board. After the Board has completed its investigation, the record will be made available to parties in interest upon oral or written inquiry to the District Commander or Officer in Charge, Marine Inspection, having cognizance of such investigation. Also, such records will be made available to persons otherwise properly and directly concerned upon written application to the District Commander or Officer in Charge, Marine Investigation, having cognizance of such investigation.

(b) Records of a Marine Board of Investigation shall include testimony and/or statements of witnesses, exhibits, records of investigation made by an investigating officer, and any other evidentiary material used by the Board in arriving at its determination.

(c) The report of a Marine Board of Investigation, consisting of the findings of fact, conclusions, opinions, and recommendations shall not become public or be made available until final action thereon has been taken by the Commandant. At such time the report will be made available in the same manner as provided for the record of investigation in paragraph (a) of this section.

§ 136.13–30 Records confidential.

(a) Except as specifically set forth in this subpart, all files, records, testimony, documents, reports, or other data pertaining to the internal management of the Marine Board of Investigation or to the investigation or disposition of charges or petitions during the non-public investigative stages of the investigation and before the institution of a Marine Board in the course of investigation, which have not been offered in evidence during the investigation or have not been made a part of the official record by stipulation, in Coast Guard Headquarters or in other offices, are administrative records and are not available to public inspection.

§ 136.13–35 Production upon compulsory process.

(a) When a request for information or material from a marine casualty investigation record is denied for any reason, the applicant shall be advised that the information or material may be produced upon service of a subpena duces tecum or an order from a court of competent jurisdiction if such information or material is not held confidential for security reasons.

§ 136.13–40 Costs.

The access to and release of information, as authorized in this subpart, shall be subject to the payment of costs. (See 33 CFR 1.25.)

Subpart 136.15—Persons in Service of Coast Guard

§ 136.15–1 Persons in service of Coast Guard.

(a) No person in the service of the Coast Guard shall, without prior approval of the Commandant, give any testimony with respect to any investigation or any other official proceedings in any suit or action in the courts. This applies equally to cases in state or Federal courts and to civil as well as criminal cases.

(b) In cases involving (1) civil litigation between private parties; or, (2) criminal matters before state courts; or, (3) civil litigation for or against the United States where Coast Guard personnel are called by parties opposing the United States; an affidavit by the litigant or his attorney setting forth the interest of the litigant and the information with respect to which the testimony of such Coast Guard officer or employee is desired must be submitted before permission to testify will be granted. Permission to testify will, in all cases, be limited to the information set forth in the affidavit, or to such portions thereof as may be deemed proper. In addition to the permission required by this paragraph, the Commandant may insist that the appearance of the Coast Guard officer or employee as a witness be conditioned on the issuance of a subpena or subpena duces tecum (as appropriate) from a court of competent jurisdiction.

(c) In cases where the appearance of Coast Guard personnel is desired by counsel representing the United States to support the affirmative claims or defenses of the United States in civil matters or on behalf of the United States in criminal matters no affidavit as described in paragraph (b) of this section shall be required, but the Commandant's prior approval must nevertheless be obtained, except in those cases where the Coast Guard personnel desired as witnesses file the original complaint or have made original inquiry into the subject matter which resulted in the filing of an original complaint.

Subpart 136.19—Construction of Regulations and Rules of Evidence

§ 136.19–1 Construction of regulations.

The regulations in this part shall be liberally construed to insure just, speedy, and inexpensive determination of the issues presented.

§ 136.19–5 Adherence to rules of evidence.

As hearings under this part are administrative in character, strict adherence to the formal rules of evidence is not imperative. However, in the interest of orderly presentation of the facts of a case, the rules of evidence should be observed as closely as possible.

Subpart 136.21—Computation of Time

§ 136.21–1 Computation of time.

The time, within which any act, provided by the regulation in this subchapter, or an order of the Marine Board of Investigation is to be done, shall be computed by excluding the first day and including the last unless the last day is Sunday or a legal holiday, in which case the time shall extend to and include the next succeeding day that is not a Sunday or legal holiday: *Provided, however,* That where the time fixed by the regulations in this subchapter or an order of the Board is five days or less all intervening Sundays or legal holidays, other than Saturdays, shall be excluded.

Subpart 136.23—Evidence of Criminal Liability

§ 136.23–1 Evidence of criminal liability.

If as a result of any investigation or other proceeding conducted hereunder, evidence of criminal liability on the part of any licensed officer or certificated person or any other person is found, such evidence shall be referred to the U.S. Attorney General.

PART 137—SUSPENSION AND REVOCATION PROCEEDINGS

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AUTHORITY: The provisions of this Part 137 issued under R.S. 4405, as amended, and 4462, as amended, and sec. 633, 63 Stat. 545; 46 U.S.C. 375, 416, 14 U.S.C. 633. Interpret or apply R.S. 4426, as amended, and 4450, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, secs. 7, 17, 54 Stat. 165, 166, as amended, secs. 1 to 12, 60 Stat. 237–244, secs. 1, 2, 68 Stat. 484, sec. 3, 68 Stat. 675, sec. 3, 70 Stat. 152; 46 U.S.C. 239, 239a, 239b, 367, 390b, 404, 526f, 526p, 5 U.S.C. 1001–1011, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–9, August 3, 1954, 19 F.R. 5195; 167–14, November 26, 1954, 19 F.R. 8026; 167–15, January 3, 1955, 20 F.R. 840; 167–17, June 29, 1955, 20 F.R. 4976; 167–20, June 18, 1956, 21 F.R. 4894.

Subpart 137.01—Authority and Scope

§ 137.01–1 Authority for regulations.

(a) The authority to prescribe regulations generally with respect to navigation and vessel inspection is set forth in Title 46, U.S. Code, sections 375 and 416 (R.S. 4405, as amended, 4462, as amended). Under the provisions of Title 46, U.S. Code, section 372 (R.S. 4403, as amended), the Commandant, United States Coast Guard, superintends the administration of the navigation and vessel inspection laws, and is required to produce a correct and uniform administration of such laws, rules and regulations.

(1) Where the provisions in Title 46, U.S. Code, section 239, or other laws or regulations contain a reference to "title 52 of the Revised Statutes or of any of the regulations issued thereunder," or one similar to it, it is deemed to be a general reference to the applicable provisions in Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 375, 391, 391a, 392, 393, 399, 400, 402–414, 416, 435, 436, 451–453, 460, 461, 462, 467, 470–482, and 489–498, and the regulations issued thereunder, which are in this chapter.

(b) The mandatory provisions in Title 46, U.S. Code, section 239, govern suspension and revocation proceedings and are the basic authority therefor; while the Administrative Procedure Act (Title 5, U.S. Code, sections 1001–1011, 60 Stat. 237–244) and Title 46, U.S. Code, section 239b (P.L. 500, 83d Cong., approved July 15, 1954, 68 Stat. 484), re-

quire the hearings in such proceedings to be presided over by an examiner, before the Coast Guard may suspend or revoke a license, certificate, or document issued.

(c) Other marine safety laws and regulations in this chapter also provide authority for suspension or revocation of specific categories of licenses, certificates or documents issued by the Coast Guard or predecessor authorities. For examples, see Title 46, U.S. Code, sections 214, 224a, 226, 228, 229, 229c, 232, 234, 240, 246, 391a, 457, 526f, 672, or Title 33, U.S. Code, sections 153, 412, 435, 442, 1006.

(d) Other authority to promulgate regulations deemed appropriate to carry out the provisions of any law applicable to the Coast Guard or to issue rules, orders, and instructions, not inconsistent with law, is set forth in Title 14, U.S. Code, section 633.

§ 137.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950 (5 U.S. Code, Note under 241), effective July 31, 1950, the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury with certain specified exceptions. The Secretary of the Treasury by a Treasury Department Order 120, dated July 31, 1950 (15 F.R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946. This included suspension or revocation of any license, certificate, or document issued by the Coast Guard or predecessor authorities under Title 46, U.S. Code, section 239. The Commandant delegates to examiners the authority to suspend or revoke any license, certificate, or document issued to a person by the Coast Guard or predecessor authorities under any navigation or vessel inspection law.

(b) The Acting Secretary of the Treasury in Treasury Department Order 167–9, dated August 3, 1954 (19 F.R. 5195), delegated to the Commandant, United States Coast Guard, the functions vested in the Secretary of the Treasury by Title 46, U.S. Code, sections 239a and 239b (P.L. 500, 83d Cong., approved July 15, 1954, 68 Stat. 484) to revoke a license, certificate, or document of a person convicted of a narcotic drug law violation or otherwise involved with narcotics. The Commandant delegates to examiners the authority to revoke a license, certificate, or document issued to a person by the Coast Guard or predecessor authorities under any navigation or vessel inspection law.

(c) The Secretary of the Treasury by Treasury Department Order 167–20, dated June 18, 1956 (21 F.R. 4894), delegated to the Commandant, United States Coast Guard, the functions vested in the Secretary of the Treasury by Title 46, U.S. Code, sections 390–390g, 404, and 526f (P.L. 519, 84th Cong., approved May 10, 1956, 70 Stat. 151–154). The Commandant delegates to examiners the authority to revoke or suspend a license issued to a person by the Coast Guard under Title 46, U.S. Code, sections 390b, 404 and 526f.

§ 137.01–10 Purpose of regulations.

(a) The regulations establish policies and procedures for remedial action (in respect to licenses, certificates and documents already issued to persons) pursuant to the authority set forth in § 137.01–1, and the regulations prescribed thereunder by the Commandant which are in this part or in Part 1 of this chapter.

§ 137.01–15 Purpose of suspension and revocation proceedings.

(a) The suspension and revocation proceedings are for the purpose of assisting in carrying out the statutory duty of the Coast Guard to promote safety of life and property. This obligation extends to the interest of passengers, crews, cargoes, shipowners and the general public.

§ 137.01–20 Nature of suspension and revocation proceedings.

(a) The suspension and revocation proceedings are remedial and not penal in nature because they are intended to maintain standards of competence and conduct essential to the purpose stated in § 137.01–15 to promote the safety of life and property at sea by insuring that the licensed or certificated persons continue to be qualified to carry out their duties and responsibilities.

§ 137.01–25 Construction of regulations.

(a) The regulations in this part shall be liberally construed so as to obtain just, speedy and economical determination of the issues presented.

§ 137.01–30 Instituting suspension and revocation proceedings.

(a) Suspension and revocation proceedings shall be instituted by an investigating officer in any case in which it appears, as a result of any investigation made under this part or Part 136, that there are reasonable grounds to believe that the holder of a license, certificate or document issued by the Coast Guard or its predecessor authorities, has:

(1) Committed an act of incompetency, misconduct, negligence, or unskillfulness while acting under the authority of his license, certificate or document; or,

(2) Endangered life while acting under the authority of his license, certificate or document; or,

(3) Willfully violated any of the provisions of title 52 of the Revised Statutes or of any of the regulations issued thereunder; or

(4) Been convicted of a narcotic drug law violation, or has been a user of or addicted to the use of a narcotic drug, so as to be subject to provisions of Title 46, U.S. Code, section 239b.

§ 137.01–35 Acting under authority of license, certificate, or document.

(a) A person employed in the service of a vessel is considered to be acting under the authority of a license, certificate or document held by him either when the holding of such license, certificate or document is required by law or regulation or is required in fact as a condition of employment. A person does not cease to act under the authority of his license, certificate or document while ashore on authorized or unauthorized shore leave from the vessel.

§ 137.01–40 Violation of law or regulation.

(a) Under Title 46, U.S. Code, section 239, suspension and revocation proceedings may be conducted, without regard to whether the person charged was in the service of a vessel at the time of the alleged offense, when the charge is a willful violation of any of the provisions of title 52 of the Revised Statutes or of any of the regulations issued thereunder.

§ 137.01–45 Violation of narcotic laws.

(a) Under Title 46, U.S. Code, section 239b, revocation proceedings may be conducted if the person charged holds a valid license, certificate or document issued by the Coast Guard or its predecessor authorities without regard to whether or not the holder was in the service of a vessel at the time of the alleged offense.

Subpart 137.02—Definitions of Terms Used

§ 137.02–1 Commandant.

(a) This term means the Commandant of the Coast Guard.

§ 137.02–5 Coast Guard District.

(a) A Coast Guard District is a geographical area which is assigned to a Coast Guard District Commander.

(b) For descriptions of the Coast Guard districts see 33 CFR Part 3.

§ 137.02–10 District Commander.

(a) This term means an Officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his respective district, which include the inspection, enforcement, and administration of Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 375, 381, 391, 391a, 392, 393, 399, 400, 402–414, 416, 435, 436, 451–453, 460, 461, 462, 464, 467, 470–482, and 489–498, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder, except those functions of examiners under the Administrative Procedure Act (5 U.S. Code 1001–1011).

§ 137.02–15 Examiner.

(a) An examiner shall mean any person designated by the Commandant pursuant to the Administrative Procedure Act (5 U.S. Code 1001–1011) for the purpose of conducting hearings arising under Title 46, U.S. Code, section 239 or 239b.

§ 137.02–20 Investigating officer.

(a) An investigating officer is an officer or employee of the Coast Guard designated by the Commandant or the

District Commander for the purpose of making an investigation of marine casualties and accidents or other matters pertaining to the conduct of seamen. An Officer in Charge, Marine Inspection, within his assigned marine inspection zone is an investigating officer without further designation by the Commandant or the District Commander.

§ 137.02–25 Marine inspection zone.

(a) A marine inspection zone is a geographical area within a Coast Guard District which is assigned to an Officer in Charge, Marine Inspection.

(b) For descriptions of marine inspection zone boundaries see 33 CFR Part 3.

Subpart 137.03—Statements of Policy and Interpretations

§ 137.03–1 Effect of Commandant's decisions in appeal or review cases.

(a) The decisions of the Commandant in cases of appeal or review of examiners' decisions shall be officially noticed by and shall be binding upon all examiners. The examiners shall follow the principles and policies enunciated by the Commandant in such decisions unless they are modified or rejected by competent authority.

§ 137.03–3 Offenses for which revocation of licenses or documents is mandatory.

(a) Whenever a charge of misconduct by virtue of the possession, use, sale or association with narcotic drugs, including marijuana, is found proved, the examiner shall enter an order revoking all licenses, certificates and documents held by such a person.

(b) In a hearing held under Title 46, U.S. Code, section 239, on a charge of misconduct involving narcotics, whereever the person charged is shown to have had possession of the narcotic drug, such possession shall be deemed sufficient evidence to authorize the revocation of his license, certificate, or document unless other evidence explains the possession to the satisfaction of the examiner.

§ 137.03–5 Offenses for which revocation of licenses or documents is sought.

(a) The Coast Guard will initiate administrative action seeking the revocation of licenses, certificates or documents held by persons who have been involved in acts of such serious nature that permitting such persons to sail under their licenses, certificates and documents would be clearly a threat to the safety of life or property.

(b) These offenses, which are deemed to affect safety of life at sea, the welfare of seamen or the protection of property aboard ship, are:

(1) Assault with dangerous weapon (injury).

(2) Malicious destruction of ship's property.

(3) Misconduct resulting in loss of life or serious injury.

(4) Molestation of passengers.

(5) Murder or attempted murder.

(6) Mutiny.

(7) Perversion.

(8) Possession, use, sale or association with drugs, including marijuana.

(9) Sabotage.

(10) Serious neglect of duty.

(11) Serious theft of ship's property or stores.

(12) Smuggling of aliens.

§ 137.03–7 Effect of court actions.

(a) Except for the serious offenses referred to in §§ 137.03–3, 137.03–5, and 137.03–10, the Coast Guard in other situations will take into consideration court convictions when determining whether or not to initiate administrative action seeking the suspension or revocation of licenses, certificates or documents.

§ 137.03–10 Court convictions in narcotic cases.

(a) After proof of a narcotics conviction by a court of record as required by Title 46, U.S. Code, section 239b, whether or not further court action is pending, the Coast Guard may take action based upon this conviction. After proof of alleged conviction or plea of "guilty," the examiner shall enter an order revoking the seaman's licenses, certificates, and documents. A conviction becomes final when no issue of law or fact determinative of the seaman's guilt remains to be decided by the trial court.

(b) An order of revocation will be rescinded by the Commandant if the seaman submits satisfactory evidence that the court conviction on which the revocation is based has been set aside for all purposes (see § 137.20–190(b)). An order of revocation will not be rescinded as the result of the operation of any law providing for the subsequent conditional setting aside or modification of the court conviction, in the nature of the granting of clemency or other relief, after the court conviction has become final.

(c) After the conviction has become final within the meaning of paragraph (a) of this section, the conditional setting aside or modification of the conviction will not act as a bar to the subsequent revocation of a seaman's document under Title 46, U.S. Code, section 239b.

§ 137.03–15 Court of record.

(a) In the administration of Title 46, U.S. Code, section 239b, and this part, a "court of record" means a court:

(1) Which conforms with the common law principles in that it has a clerk, a seal, keeps a record of its proceedings, and has the power to fine and imprison; and,

(2) Where its proceedings are, by law or usage in the State, District of Columbia, or Territory where rendered, recognized as conclusive evidence in other courts of that jurisdiction.

§ 137.03–20 Maritime labor disputes.

(a) Under no circumstances shall the statutory machinery of the Coast Guard be used for the purpose of favoring any party to a maritime or other labor controversy. However, if a situation affecting the safety of the vessel or persons on board is presented, and a complaint in writing is lodged, the matter shall be thoroughly investigated and when a violation of existing statutes or regulations is indicated appropriate action shall be taken.

§ 137.03–25 Physician-patient privilege.

(a) For the purpose of these proceedings, the physician-patient privilege is not considered to exist between a ship's physician and a seaman employed on the same ship.

Subpart 137.05—Investigations

§ 137.05–1 Investigations made by investigating officer.

(a) Investigations will be made by an investigating officer of:

(1) All acts in violation of any of the provisions of Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 375, 381, 391, 391a, 392, 393, 399, 400, 402–414, 416, 435, 436, 451–453, 460, 461, 462, 464, 467, 470–482, and 489–498, whether or not committed in connection with any marine casualty or accident; and

(2) All acts in violation of any regulation in this chapter or in 33 CFR Chapter I, whether or not committed in connection with any marine casualty or accident; and

(3) All acts of incompetency, negligence or misconduct, whether or not committed in connection with any marine casualty or accident, when committed by persons holding licenses, certificates or documents.

§ 137.05–5 Powers of investigating officer.

(a) In the conduct of an investigation, the investigating officer shall have the power to administer oaths, subpena witnesses, require persons having knowledge of the subject matter of the investigation to answer questions and require the production of relevant books, papers, documents, licenses, certificates, or other records.

§ 137.05–10 Advising person of complaint.

(a) The investigating officer conducting an investigation under this part will, where the person whose conduct is being investigated is available, advise such person informally of the substance of the complaint against him and afford him an opportunity to make such comment as he may desire.

§ 137.05–15 Courses of action available.

(a) During or at the conclusion of an investigation, the investigating officer shall take appropriate action as follows:

(1) *Prefer charges.* The investigating officer may prefer charges if he finds reasonable grounds to believe that a person holding a license, certificate or document has committed some offense or act, or has been convicted for a narcotic offense, or has failed to perform some duty, or is incompetent.

(2) *Recommend closing the case.* The investigating officer may recommend closing the case and taking no action on alleged acts if he finds that there is no:

(i) Basis for the complaint; or,

(ii) Jurisdiction; or,

(iii) Reasonable expectation that corrective measures could be accomplished.

(3) *Refer cases to others for further action.* The investigating officer may refer the case to the Commandant or to an Officer in Charge, Marine Inspection, at any port for completion of administrative action if he finds adequate basis for action and the person under investigation and/or witnesses are not then available.

(4) *Accept voluntary deposit of license, certificate or document.* The investigating officer may accept a voluntary deposit of a license, certificate or document from a person under investigation when there is evidence of physical or mental incompetence from any cause other than the use of, or addiction to narcotics.

(5) *Accept voluntary surrender of license, certificate or document.* The investigating officer may accept the voluntary surrender of a license, certificate or document when the person under investigation desires to avoid a hearing.

(6) *Give a warning.* The investigating officer may give a warning in writing to any person holding a license, certificate or document and recommend closing the case. Upon refusal to accept the written warning at the time the warning is given, it shall be withdrawn and the investigating officer may prefer charges. An unrejected warning will become a part of the person's record.

(b) When required, the investigating officer will also submit a report of investigation.

§ 137.05–17 Charges and specifications.

(a) A "charge" is a designation of an offense in general terms. The offense must be one within the purview of Title 46, U.S. Code, section 239 or 239b. A "charge" must be supported by one or more "specifications." Under no circumstances does a "charge" constitute evidence of guilt nor may any inference of guilt be drawn from the fact that the holder of a license, certificate, or document has been the subject of a "charge."

(b) A "specification" sets forth the facts which form the basis of the "charge." The purpose of a "specification" is to enable the person charged to identify the offense so that he will be in a position to prepare his defense. Each specification shall state:

(1) Basis for jurisdiction;

(2) Date and place of offense; and,

(3) A statement of the facts constituting the offense.

§ 137.05–20 Types of charges.

(a) *General.* In lieu of or supplementary to the charges described in paragraphs (b) and (c) of this section, the charges may be:

(1) *Misconduct.* "Misconduct" is a human behavior which violates some formal, duly established rule, such as the common law, the general maritime law, a ship's regulation or order, or shipping articles. In the absence of such a rule, "misconduct" is human behavior which a reasonable person would consider to constitute a failure to conform to the standard of conduct which is required in the light of all the existing facts and circumstances.

(2) *Negligence or inattention to duty.* "Negligence" and "inattention to duty" are essentially the same and cover both the aspects of misfeasance and nonfeasance. They are therefore defined as the commission of an act which a reasonably prudent person of the same station, under the same circumstances, would not commit, or the failure to perform an act which a reasonably prudent person of the same station, under the same circumstances, would not fail to perform.

(3) *Incompetence.* "Incompetence" is the inability on the part of a person to perform required duties, whether due to professional deficiencies, physical disability, mental incapacity, or any combination of same.

(b) *Violation of law or regulation.* Where the proceeding is based exclusively on that part of Title 46, U.S. Code, section 239, which refers to a willful violation of any of the provisions of title 52 of the Revised Statutes or of any of the regulations issued thereunder, the "charge" shall be "violation of statute" or "violation of regulation." The "specification" shall state the specific statute or regulation by title and section number, and the particular manner in which it was allegedly violated.

(c) *Narcotic drug law violation or use or addiction to use of narcotics.* Where the proceeding is based exclusively on the provisions of Title 46, U.S. Code, section 239b, the "charge" will be "conviction for a narcotic drug law violation" or "use of narcotics" or "addiction to use of narcotics," depending upon the circumstances. The "specification" will allege jurisdiction by stating the elements as required by Title 46, U.S. Code, sections 239 and 239b, and the approximate time and place of the offense.

§ 137.05–23 Time limitations for service of charges and specifications.

(a) The time limitations for service of various charges and specifications are as follows:

(1) For a charge and specification based exclusively on Title 46, U.S. Code, section 239b, service shall be within the time as set forth in this law; namely, 10 years after date of conviction in a court of record subsequent to July 15, 1954, or at any time if a user of or addicted to the use of a narcotic drug after July 15, 1954.

(2) For a charge and specification describing one of the more serious types of offenses specified in § 137.03–5, service shall be within five years after the commission of the offense alleged therein.

(3) For a charge and specification describing an offense not otherwise provided for, the service shall be within three years after the commission of the offense alleged therein.

(b) When computing the period of time specified in this section there shall be excluded any period or periods of time when the person could not attend a hearing by reason of being in a foreign country or by reason of being in prison or asylum.

§ 137.05–25 Procedure preparatory to hearing.

(a) To institute hearing proceedings preparatory to hearing, the investigating officer shall prepare charges and specifications, as required, together with a notice of the time and place of the hearing.

(b) The notice of the time and place of the hearing and the original of the charges and specifications shall be served upon the person charged, either by personal service or by certified mail with return receipt requested, notice to be signed by the addressee only.

(c) When service is by mail, it shall be sufficiently in advance of the time set for the hearing so as to give the person charged a reasonable opportunity to prepare his defense.

(d) When service is made personally upon the person charged, the person making such service shall give the original of the notice of the hearing, the charges and the specifications to the person charged, shall read them to such person if he cannot read, and shall make a record of the time and date of service. When personal service is made, the written acceptance on the reverse side of the form containing the charges and specifications shall be sufficient to show service as of the date on the face of the form unless otherwise indicated by separate notation thereon by the person effecting such service.

(e) Further, at the time of such service, whether personal or by registered mail, the person charged will be also advised with respect to:

(1) The nature of suspension and revocation proceedings and the possible results thereof.

(2) His right to have counsel represent him at the hearing, and that counsel may be a lawyer or any other person he desires to represent him.

(3) His right to have witnesses and/or records subpenaed in his behalf.

(f) If the offense alleged involves mental incompetence, the person charged shall be advised (when the service of the charge and specification and notice of hearing is made) to procure counsel to represent him.

§ 137.05–30 Evidence of criminal liability.

(a) If, as a result of any investigation, evidence of criminal liability on the part of any holder of a license, certificate or document, or any other person is found, such evidence shall be referred to the Attorney General, or his local representative.

(b) The investigating officer shall determine whether to institute suspension and revocation proceedings under Title 46, U.S. Code, section 239 or 239b, for use or addiction to the use of narcotics, before criminal action may be initiated or completed against the holder of a license, certificate or document, or to defer instituting such proceedings pending the outcome of the criminal action in a Federal or State court. One controlling

factor will be whether or not the witnesses will be available if the hearing is delayed.

Subpart 137.10—Deposit or Surrender of License, Certificate or Document

§ 137.10–1 Voluntary deposit in event of mental or physical incompetence.

(a) A person may deposit his license, certificate or document with an investigating officer in any case where there is evidence of mental or physical incompetence for any reason other than when caused by use of, or addiction to, narcotics.

(b) A voluntary deposit is accepted on the basis of a written agreement which specifies the conditions accompanying the deposit. The original or a copy will be given to the person making the deposit. The Coast Guard agrees to return the license, certificate or document deposited by the person described therein when he obtains a certificate from the U.S. Public Health Service, or other authorized medical officer showing the person is considered to be fit for sea duty.

(c) Where the mental or physical incompetence of a holder of a license, certificate or document is caused by use of, or addiction to, narcotics, such person may only surrender such license, certificate or document in accordance with § 137.10–10.

§ 137.10–10 Voluntary surrender to avoid hearing.

(a) Any person may surrender his license, certificate or document to an investigating officer in preference to appearing at a hearing.

(b) Whenever a person voluntarily surrenders his license, certificate or document, he shall sign a written statement containing the following stipulations that:

(1) This surrender is made voluntarily in preference to appearing at a hearing;

(2) All title to the license, certificate or document surrendered is permanently relinquished; and,

(3) His rights with respect to a hearing, appeal, and review are waived.

(c) A voluntary surrender of a license, certificate or document to an investigating officer in preference to appearing at a hearing should not be accepted by an investigating officer unless the investigating officer is convinced that the seaman fully realizes the effect of such surrender.

Subpart 137.13—Issuance of New Licenses, Certificates or Documents After Revocation or Surrender

§ 137.13–1 Time limitations.

(a) Any person whose license, certificate or document has been revoked or surrendered for one or more of the offenses described in §§ 137.03–3, 137.03–5, and 137.03–10, or for mental or physical incompetence resulting from use of, or addiction to, narcotics may after three years apply by letter and the application form requesting the issuance of a new license, certificate or document.

(b) Any person whose license, certificate or document has been revoked or surrendered for one or more offenses which are not specifically described in §§ 137.03–3 and 137.03–5 may after one year apply by letter and the application form requesting the issuance of a new license, certificate or document.

§ 137.13–5 Application.

(a) The letter and application shall be addressed to the Commandant, U.S. Coast Guard, Washington, D.C., 20226, but should be filed in person with the nearest Officer in Charge, Marine Inspection, since this officer will submit a preliminary evaluation and recommendation.

(b) The letter shall be an informal request for the issuance of a new license, certificate or document and shall transmit the following:

(1) A letter from each employer during time applicant was without a license or document, stating dates of employment and attesting to the satisfactory work record. (Times or periods of unemployment shall be satisfactorily explained in the letter.)

(2) At least three character references from responsible persons and stating how long they have known him.

(c) The Officer in Charge, Marine Inspection, will forward the letter and application, together with a preliminary evaluation and recommendation, to the Commandant.

§ 137.13–10 Commandant's decision on application.

(a) Every letter and application received, as well as the preliminary evaluation and recommendation of an Officer in Charge, Marine Inspection, will be referred to a special board appointed by the Commandant. The board will examine all the material submitted with the application and such other information as may, in the judgment of the board, be considered necessary. The board shall submit its findings and recommendations to the Commandant.

(b) The Commandant shall determine whether or not the issuance of a new license, certificate or document shall be made.

Subpart 137.15—Subpenas and Service of Process

§ 137.15–1 Authority for subpenas.

(a) There is delegated to investigating officers and examiners authority to issue subpenas under Title 46, U.S. Code, section 239, to command attendance of witnesses or the production of books, papers, documents, or any other evidence necessary.

§ 137.15–5 Form of subpena.

(a) Every subpena shall bear at least the name "United States Coast Guard", the word "subpena", and local Coast Guard address from which issued. It may be a letter or Form CG–2639B.

(b) Every subpena shall command the person to whom it is directed to attend at a specified time and place to give testimony or to produce books, papers, documents, or any other evidence, which shall be described with such particularity as necessary to identify what is desired.

§ 137.15–10 Issuance of subpenas.

(a) During the investigation and prior to the hearing, the investigating officer shall issue subpenas for the attendance of witnesses or for the production of books, papers, documents, or any other relevant evidence that he may need or that may be needed by the person charged.

(b) During the hearing, the examiner shall issue subpenas for the attendance and the giving of testimony by witnesses or for the production of books, papers, documents, or any other relevant evidence, either upon his own motion or upon a request of either of the parties.

§ 137.15–15 Service of subpenas.

(a) Any person capable of reading and writing may serve a subpena upon the person named therein. Service of a subpena upon a person named therein shall be made by delivering such subpena to such person by personal service, or by certified mail with return receipt to be signed by the addressee only.

(b) The investigating officer shall serve or have served every subpena that he issues in his own behalf, or on behalf of the person charged when feasible.

(c) The person charged or his counsel is responsible for serving subpenas issued at his request by an examiner. However, if the examiner finds that the person charged or his counsel is physically unable to effect the service, despite diligent and bona fide attempts to do so, and if the examiner further finds that the existing impediment to the services of the subpena is peculiarly within the authority of the Coast Guard to overcome, the examiner will have the subpena delivered to such person as the District Commander may designate for the purpose of effecting service.

§ 137.15–20 Proof of service.

(a) The person serving a subpena shall make a written statement setting forth the date, time and manner of service and shall return such report with or on a copy of the subpena to the investigating officer or examiner who issued it. In case of failure to make service of a subpena, the person assigned to serve such subpena shall make a written statement setting forth the reasons, which statement should be on the subpena or attached to it.

(b) When service of a subpena is made by certified mail with return receipt to be signed by the addressee only, the person mailing the subpena shall make a written statement on a copy of the subpena or attached to it, setting forth the date, time and place of Post Office where mailed, and Post Office number assigned thereto. If delivered, the receipt requested shall be returned to the investigating officer or examiner who issued the subpena. In case the subpena is not delivered, any information reported by the Post Office regarding non-delivery shall be given to the in-

vestigating officer or examiner who issued the subpena.

§ 137.15–25 Quashing a subpena.

(a) The person to whom a subpena is directed may, prior to or during the hearing, apply in writing to the examiner conducting the hearing a request that the subpena be quashed or modified. The examiner will notify the party for whom the subpena was issued.

(b) The examiner shall rule on the matter promptly. He may quash the subpena if it is unreasonable or requires evidence not relevant to any matter in issue, or he may deny the request.

§ 137.15–30 Enforcement.

(a) Upon application and for good cause shown, or upon its own initiative, the Coast Guard will seek judicial enforcement of subpenas issued by investigating officers or examiners. This may be done by making application to the United States District Court to issue an order compelling the attendance of, and/or the giving of testimony by, witnesses.

Subpart 137.17—Witness Fees

§ 137.17–1 Witness's request for payment of fees.

(a) Duly subpenaed witnesses, other than government employees, may apply for payment for their services as witnesses by submitting a request for payment (Standard Form No. 1157) to the examiner presiding over the hearing or to the investigating officer (28 U.S. Code, section 1821). The examiner or investigating officer will forward the request to the Coast Guard authorized certifying officer together with a statement that:

(1) The witness seeking payment was duly subpenaed as a witness by the Coast Guard;

(2) The witness appeared pursuant to such subpena, the name of the person charged or under investigation, and the name of city and state where investigation or hearing was held; and,

(3) The witness is entitled to witness fees, and/or subsistence, and/or mileage allowance claimed.

(b) Upon receipt of the witness's claim (Standard Form 1157) with supporting statement, the Coast Guard authorized certifying officer may certify to the propriety of the claim according to the scale of fees, subsistence, and mileage in § 137.17–5, and submit it to the appropriate disbursing officer for payment.

(c) Government employees who are witnesses at a hearing or investigation may be paid travel expenses as provided by the Standardized Government Travel Regulations. Coast Guard personnel may be paid travel expenses as provided in the Coast Guard Travel Manual.

§ 137.17–5 Scale of fees, subsistence, and mileage.

(a) A subpenaed witness may be paid a fee of $4.00 for each day or fraction thereof of attendance and for time necessarily occupied in going to and returning from the place of hearing or investigation (28 U.S. Code, section 1821). A witness called to testify as an expert may be paid a higher fee provided such higher fee is approved by the Commandant prior to his appearance.

(b) A subsistence allowance of $8.00 for each day or fraction thereof may be paid if the subpenaed witness resides at a distance so far removed from the place at which the hearing or investigation was held so as to prohibit his returning to his place of residence each day, and if such witness was required to remain at the place where the hearing or investigation was held for more than one day. In a case where subsistence allowance is payable under this paragraph and the subpenaed witness is required to travel, a subsistence allowance of $8.00 per day may be paid for each day necessarily occupied in traveling from the place of residence to attend the hearing or investigation and return to such place: *Provided*, That no subsistence allowance for travel time shall be paid if the witness is already present at place of investigation or hearing at time of service of subpena.

(c) In computing the witness fee or the subsistence allowance, a fraction of a day will be considered as a whole day, the day will be considered as consisting of 24 hours, and a day will be regarded as beginning on the hour at which the witness had to leave his residence in order to arrive at the appointed time at the place where the investigation or hearing was held. After dismissal, the witness is assumed to leave the place of the investigation or hearing for his residence by the first available transportation, and the period of time will be terminated at the time of arrival at his residence.

(d) Travel money at the rate of 8 cents per mile, not to exceed 100 miles, for actual travel from place of residence or place where subpena was served to place at which the investigation or hearing was held may be paid to a subpenaed witness. Travel money at the rate of 8 cents per mile, not to exceed 100 miles, is also allowed for the actual travel involved in return of witness to his place of residence, or if the subpena was served at a place other than the witness's place of residence, to the place where said subpena was served. All payments of travel money shall be computed on the basis of mileage by the shortest route. When a witness is furnished transportation by the Government, no mileage allowance is authorized. If a witness is unable to furnish funds for transportation charges, Government transportation requests may be issued for his transportation, at the lowest first class rate available, to and from the place of hearing, in which case the mileage allowance is not authorized. When two or more witnesses are transported at the same time in the privately owned vehicle, operated by one of the witnesses, the mileage allowance for only one witness is authorized.

(e) The fees provided in paragraphs (a), (b), and (d) of this section shall not apply in Alaska. In Alaska subpenaed witnesses are entitled to the fees, subsistence, and mileage allowances to the same extent as may be prescribed for witnesses before the United States District Court in the judicial division in which the hearing is held. (See 28 CFR 21.3 for schedule of fees and allowances of witnesses in the District of Alaska.)

(f) In the case of employed merchant marine personnel their place of residence will be construed to be the vessel upon which they are employed, and in the case of unemployed merchant marine personnel their place of residence will be construed to be their actual place of residence when ashore at time of the investigation or hearing rather than the residence of their next of kin.

Subpart 137.20—Hearings

§ 137.20–1 General.

(a) A hearing in a suspension and revocation proceeding conducted under Title 46, U.S. Code, section 239 or 239b, is the adjudication of the case. It is presided over and is conducted under the exclusive administrative control of a civilian examiner in accordance with applicable requirements in Title 5, U.S. Code, sections 1001–1011, inclusive (Administrative Procedure Act), and the regulations in this part. The examiner shall regulate and conduct the hearing in such a manner so as to bring out all the relevant and material facts, and to insure a fair and impartial hearing.

(b) An examiner shall not consult with any one concerning any fact in issue in a suspension and revocation proceeding unless, after notice, all parties are permitted to participate. An examiner shall not informally obtain advice or opinions from the parties or their counsel or from any officer or employee of the Coast Guard as to the weight or interpretation to be given to evidence. The examiner may at any time consult with or receive instructions from the Commandant.

(c) The procedure usually followed in a hearing is:

(1) Examiner's opening statement.

(2) Appearances of persons at the hearing.

(3) Verification of currently valid license, certificate and/or document held by person charged.

(4) Examiner advises person charged of his rights.

(5) Exclusion of witnesses from the hearing room.

(6) Preliminary motions, objections and/or corrections to the charges and specifications.

(7) Arraignment and plea of person charged.

(8) Opening statement of investigating officer.

(9) Opening statement by or on behalf of person charged or statement in mitigation if there has been a "guilty" plea.

(10) Submission of evidence.

(11) Argument by the investigating officer and argument by or on behalf of the person charged.

(12) Submission of proposed findings and conclusions by the investigating officer and/or by or on behalf of the person charged.

(13) Findings and conclusions of the examiner.

(14) Prior record of the person charged.
(15) The complete decision of the examiner.
(16) Service of the order or complete decision.
(17) Obtain or return the license, certificate or document, as appropriate.
(18) Advise the person charged of his right of appeal.
(19) Examiner's declaration that the hearing is closed.

§ 137.20–5 Public access to hearings.

(a) Every hearing conducted by an examiner shall be open to the public except when the examiner finds that subject matter to be or being brought out in the evidence concerns classified matter relating to national security, or when other circumstances exist which court decisions have held to warrant a limitation or exception to the right of a public hearing.

(b) Representatives of the press shall not be excluded from a hearing unless the hearing concerns classified matter relating to national security.

§ 137.20–10 Continuance of a hearing.

(a) The examiner may, for good cause to be shown in the record, either on his own motion or the motion of the investigating officer or person charged, continue the hearing from day to day or adjourn such hearing to a later date or to a different place by announcement at the hearing or by other appropriate notice. In making such determination, consistent with the rights of the person charged to a fair and impartial hearing, the examiner shall give careful consideration to the future availability of witnesses and to the prompt dispatch of the vessel or vessels on which the person charged and/or witnesses may be employed.

§ 137.20–15 Disqualification of examiner.

(a) In any suspension and revocation proceeding conducted under this part, an examiner may withdraw voluntarily from a particular case when he deems himself unqualified. In such event the examiner shall immediately notify the Commandant of his desire to withdraw and his reasons.

(b) In any case the person charged or the investigating officer may, in good faith, request the examiner to withdraw on the grounds of personal bias or other disqualification. The person seeking the examiner's disqualification shall file with the examiner a timely affidavit or statement sworn to before a Coast Guard officer or official authorized to administer oaths setting forth in detail the facts alleged to constitute the grounds for disqualification. The examiner may file a response thereto and shall rule whether or not he considers himself disqualified.

(c) If the person seeking disqualification takes exception to the ruling of the examiner, he may appeal such ruling to the Commandant. The examiner shall immediately forward the affidavit or sworn statement with his decision. If the examiner believes himself not disqualified and he so rules, the examiner shall also have all matters relating to such claims of disqualification affirmatively appear in the record. The examiner shall then proceed with the hearing unless it can be shown that a delay in the hearing pending a determination of the appeal will not interfere with the future availability of the person charged and witnesses, or the prompt dispatch of the vessel or vessels on which the person charged and/or witnesses may be employed.

§ 137.20–25 Failure of person charged to appear at hearing.

(a) In any case in which the person charged, after being duly served with the original of the notice of the time and place of the hearing and the charges and specifications, fails to appear at the time and place specified for the hearing, a notation to that effect shall be made in the record and the hearing may then be conducted "in absentia."

(b) The examiner shall also cause to be placed in the record all the facts concerning the issuance and service of the notice of hearing and the charges and specifications.

§ 137.20–27 Person charged may be required to submit to medical examination.

(a) In a hearing in which the physical or mental condition of the person charged is in controversy, the examiner on his own motion may order the person charged to submit to a medical examination, or the investigating officer may submit a written petition requesting such person to be required to submit to a medical examination by a physician. The examiner shall decide from the evidence or information submitted to him by the investigating officer whether or not to order the person charged to submit to an examination before a physician of the U.S. Public Health Service, and also to an examination before another physician if the person charged so desires and pays for the required examination.

(b) If the person named in the examiner's order fails or refuses to submit to such duly ordered examination, such failure shall receive due weight in determining the facts alleged in the specifications.

§ 137.20–30 Time and place of hearing.

(a) The hearing shall be held at the time and place specified in the notice of the hearing served upon the person charged by or under the direction of the investigating officer.

§ 137.20–35 Opening the hearing.

(a) The examiner shall open the hearing at the time and place specified in the notice, administer all necessary oaths, and cause a complete record of the proceedings to be kept.

(b) The examiner shall open the hearing with appropriate identification of the proceeding and announce the statutory jurisdiction under which the hearing is being conducted. The examiner shall describe the nature of the proceedings and state that it is concerned solely with the rights of the person charged to continue holding specific license, certificate, and/or document, and any endorsement thereon, as the case may be, issued by the Coast Guard or by any predecessor authority.

§ 137.20–37 Appearances.

(a) The appearances of persons at the hearing shall be entered in the following order:
(1) The investigating officer;
(2) The person charged; and,
(3) The counsel for the person charged, if any.

§ 137.20–40 Verification of license, certificate or document.

(a) Since the proceeding involves a license, certificate or document issued by the Coast Guard, the examiner shall require the person charged to produce and present to him at the opening of the hearing and on each day the hearing is in session thereafter, all valid licenses, certificates, and/or documents issued to the person charged. In the event that the person charged alleges he has lost any such license, certificate or document, the examiner shall require the person charged to execute a lost document affidavit (Form CG–719E). The examiner shall warn the person charged that a willful misstatement of any material item in such affidavit is punishable as a violation of a federal criminal statute.

(b) When a hearing is continued or delayed, the examiner shall return the license, certificate, and/or document to the person charged upon demand: *Provided*, That such action shall not be taken if a prima facie case has been established that the person charged committed an offense which shows that he has such propensities and proclivities as to constitute a definite danger to the safety of life or property at sea.

§ 137.20–45 Rights of person charged.

(a) The examiner shall advise the person charged of his rights to:
(1) Be represented by professional counsel, or any other person he may desire;
(2) Have witnesses and relevant evidence subpenaed;
(3) Examine witnesses, cross-examine witnesses testifying against him, and introduce relevant evidence into the record; and,
(4) Testify in his own behalf or remain silent.

(b) All matters on which the examiner is required to advise the person charged shall affirmatively appear in the record.

§ 137.20–60 Witnesses excluded from hearing room.

(a) All witnesses shall be excluded from the hearing room prior to the taking of their testimony and the examiner may separate government witnesses if he deems it desirable.

§ 137.20–63 Preliminary motions or objections.

(a) Any preliminary motion or objection shall be heard and disposed of by the examiner.

§ 137.20–65 Correction or amendment of charges and/or specifications.

(a) The examiner shall examine the charges and specifications to determine their correctness as to form and legal sufficiency.

(b) The examiner may, on his own motion or the motion of the investigating officer or person charged, permit the amendment of charges and specifications to correct harmless errors by deletion or substitution of words or figures: *Provided,* That a legal specification is left remaining. Broad and liberal discretion shall be exercised by examiners in permitting such amendments.

(c) When errors of substance are found in charges and specifications, the examiner shall rule that the defective charge or specification is withdrawn. The investigating officer may then prepare and serve a new charge and specification on the person charged.

§ 137.20–75 Arraignment and plea.

(a) The examiner shall read each charge and specification to the person charged and shall obtain from him or counsel a definite plea to each charge and specification. If the person charged does not make a definite plea, the examiner shall enter a plea of "not guilty" and proceed with the hearing.

(b) If the person charged fails to appear at the hearing, the examiner will comply with the procedures in § 137.20–25. If no valid reason to the contrary appears, the examiner shall enter pleas of "not guilty" to all the charges and specifications, and shall then proceed with the hearing.

§ 137.20–77 Burden of proof.

(a) The investigating officer has the burden of proof and shall present his evidence first.

§ 137.20–80 Opening statement of investigating officer.

(a) If the person charged pleads "not guilty," the investigating officer shall make a brief statement outlining the basis for the preferment of the charges; particulars incident to the substance of the complaint; and a summary of matters expected to be proved.

(b) If the person charged pleads "guilty," the opening statement of the investigating officer shall contain a summary of the evidence upon which the charge and specification are based.

§ 137.20–85 Opening statement by or on behalf of the person charged.

(a) The person charged or his counsel shall be afforded an opportunity to state what he intends to establish. This may be waived or deferred at the option of the person charged.

(b) If the person charged pleads "guilty," he may present evidence or mitigating circumstances believed to be material. Should this presentation be inconsistent with a "guilty" plea, the examiner shall reject the plea, change the plea to "not guilty" and proceed with the hearing.

§ 137.20–87 Coercion of witnesses.

(a) Any attempt to coerce any witness or to induce him to testify falsely, is an offense which may be punishable by fine of $5,000 or imprisonment for 5 years, or both fine and imprisonment. (See 18 U.S.C. 1505, 46 U.S.C. 239.)

§ 137.20–90 Witnesses.

(a) All witnesses shall be sworn, duly examined, and may be cross examined. At any time a witness is on the stand he may be questioned by an examiner.

(b) The investigating officer or person charged who calls a witness shall begin his direct examination by identifying the witness. When possible, the witness will be required to identify the person charged.

(c) In any case where the person charged has entered a "guilty" plea, witnesses may be called to establish matters of aggravation or matters of mitigation.

§ 137.20–93 Witness's personal counsel.

(a) Any witness may have personal counsel to advise him as to his rights, but such counsel may not otherwise participate in the hearing.

§ 137.20–95 Evidence.

(a) In these administrative proceedings, strict adherence to the rules of evidence observed in courts is not required. All relevant and material evidence, oral or written, shall be received except that hearsay evidence shall be rejected if the declarant is readily available to appear as a witness. In deciding whether the declarant's testimony should be obtained, the importance of such evidence shall be balanced against the difficulty of producing the witness. Hearsay evidence shall be accorded such weight as the circumstances warrant, including consideration of whether it is opposed by other evidence. Irrelevant, immaterial and unduly repetitious evidence should be excluded.

(b) Findings must be supported by substantial evidence of a reliable and probative character. By this is meant evidence of such probative value as a reasonably prudent and responsible person is accustomed to rely on when making decisions in important matters. It is not limited to evidence which is considered to be competent evidence for the purpose of admissibility under the jury-trial rules.

(c) In conducting a hearing the examiner will extend reasonable latitude to the person charged who does not have professional counsel to represent him. Investigating officers and counsel should be required to conform to the rules of evidence to a greater degree than persons charged without counsel.

§ 137.20–100 Documentary evidence generally.

(a) Except as modified by the regulations in this part, documentary evidence shall be admissible in accordance with the applicable rules of evidence, as set forth in § 137.20–95.

§ 137.20–102 Official notice by Commandant and examiners.

(a) The Commandant and the examiners shall consider the following without requiring the person charged or the Coast Guard to submit them in evidence:

(1) *Federal law.* The Constitution; Congressional Acts, Resolutions, Records, Journals and Committee Reports; Decisions of Federal Courts; Executive Orders and Proclamations; and all rules, regulations, orders and notices published by the Treasury Department or United States Coast Guard in the FEDERAL REGISTER.

(2) *State law.* The Constitution and public laws of each State.

(3) *Governmental organizations.* The organization, territorial limitations, officers, departments, and general administration of the Government of the United States, its territories, possessions, and the Commonwealth of Puerto Rico; the several States; and foreign nations.

(4) *Coast Guard organization.* The Coast Guard's organization, administration, officers, personnel, and official publications pertaining to organization.

(5) *Commandant's decisions.* The Commandant's decisions in all appeal and review cases under this part. (See § 137.03–1.)

(b) The Commandant and examiners may, upon request, take official notice of those matters of which the courts usually take judicial notice, and matters which adjudicated cases recognize may be officially noticed by administrative agencies. However, the matters thus officially noticed by the examiner shall be specified on the record. Either party shall be afforded an opportunity, on the record, to rebut such matters.

§ 137.20–105 Certification of court records.

(a) A copy of a court record, such as the court conviction or judgment, shall be certified to be a true copy by the clerk or deputy clerk of the court and under the seal of the court, with or without the certification of the judge that the attestation by the clerk is in proper form.

§ 137.20–106 Certification of extracts from shipping articles, logbooks, etc.

(a) Extracts from records in the custody of the Coast Guard, shipping articles, and logbooks, shall be certified by an investigating officer or custodian of such records.

(b) Any commissioned officer of the Coast Guard is authorized to certify extracts from Coast Guard records, shipping articles, and logbooks as being true copies of the original by certifying that he has seen the original and compared the copy with it and found it to be a true copy. The officer so certifying shall subscribe his name, rank, and duty station.

§ 137.20–107 Admissibility and weight of entries from Official Logbooks.

(a) The Official Logbook of a vessel, or a duly certified copy of an entry made

therein, shall be admissible in evidence, under authority of Title 28, U.S. Code, section 1732.

(b) An entry in an Official Logbook of a vessel made in substantial compliance with the requirements of Title 46, U.S. Code, section 702, in addition to being admissible in evidence, shall constitute prima facie evidence of the facts therein recited. However, an entry not made in substantial compliance with the requirements of Title 46, U.S. Code, section 702, while admissible in evidence, does not constitute prima facie evidence of the facts therein recited.

§ 137.20–110 Use of judgments of conviction.

(a) The judgment of conviction by a Federal court is conclusive in proceedings under Title 46, U.S. Code, section 239, where acts forming the basis of the charges in a Federal court are the same. The person charged may not challenge the jurisdiction of a Federal or State court in proceedings under Title 46, U.S. Code, sections 239 and 239b.

(b) Where the acts involved in a judgment of conviction of a State court are the same as those involved in proceedings under Title 46, U.S. Code, section 239, the judgment of conviction is not conclusive of the issues decided. However, such judgment of conviction is admissible in evidence in the latter proceedings and constitutes substantial evidence adverse to the person charged.

(c) The judgment of conviction for a narcotic drug law violation by a Federal court or a State court of record is conclusive in proceedings under Title 46, U.S. Code, section 239b.

§ 137.20–115 Admissibility of reports of consul.

(a) The original or a duly authenticated copy of a report made by a consul or a vice consul of the United States shall be admissible in evidence.

§ 137.20–117 Admissibility of records of proceedings at Coast Guard investigations.

(a) The records of proceedings at Coast Guard investigations, including testimony and statements of witnesses and all exhibits received, are admissible in hearings conducted under this part, pursuant to stipulation by the investigating officer and the person charged.

(b) The stipulation shall be in writing, shall describe the specific portions of the record to be submitted as evidence, and shall be signed by the investigating officer and the person charged or his counsel. The stipulation and the portions of the records referred to therein shall upon presentation be made a part of the record of the hearing.

§ 137.20–118 Admissibility of seaman's Coast Guard records.

(a) The prior negative disciplinary record of the person charged is admissible as character evidence of his general good reputation.

(b) A commendatory record pertaining to the specific trait of character in question is admissible.

(c) No part of a prior disciplinary record may be used to show particular acts in order to refute directly evidence as to the good character of the person charged. However, it is admissible for the limited purposes of:

(1) Impeaching the credibility of the person charged on cross-examination after he has testified, on direct examination, that he has no prior disciplinary record.

(2) Impeaching the credibility of the person charged by showing offenses of such a nature as to indicate his general lack of veracity.

(3) Testing the qualifications of character witnesses who express opinions concerning the general good reputation of the person charged.

(4) Proving prior conduct tending to show guilty knowledge, design, intent, motive, or the like, which is relevant to the offense alleged.

§ 137.20–120 Admissions by person charged during a Coast Guard investigation.

(a) No person shall be permitted to testify with respect to admissions made by the person charged during or in the course of a Coast Guard investigation except for the purpose of impeachment.

§ 137.20–125 Other admissions by person charged.

(a) Any person other than a Coast Guard investigating officer may testify as to admissions voluntarily made by the person charged in the presence of the witness other than during or in the course of an investigation by the Coast Guard.

§ 137.20–130 Impeachment of witnesses.

(a) A witness, including the person charged if he voluntarily testifies in his own behalf, may be impeached by proof of prior inconsistent statements, whether oral or written, which were made by him. However, before evidence of such inconsistent statements is admissible in evidence, a proper foundation must be established.

(b) Evidence of prior inconsistent statements by a witness is admissible for the limited purpose of impeaching the credibility of the witness.

(c) A party calling a witness or otherwise making a witness his own may, after orally pleading surprise, be permitted to impeach him in the discretion of the examiner.

§ 137.20–135 Testimony of absent witnesses.

(a) The testimony of a witness other than the person charged taken under oath during a Coast Guard investigation may be received in evidence in lieu of the appearance of the witness when it is established to the satisfaction of the examiner that:

(1) Whereabouts of the witness is unknown after diligent search; or,

(2) Witness is non compos mentis; or,

(3) Witness is deceased; or,

(4) Witness is ill or incapacitated to such an extent that neither his testimony nor a deposition can be taken; or,

(5) Witness is more than 100 miles from the place of hearing and at a place so remote and inaccessible as to make it impracticable to take his deposition.

(b) In considering the admissibility and credibility of the testimony taken under oath during an investigation and offered in evidence under paragraph (a) of this section, the examiner shall consider the apparent trustworthiness of the testimony, and shall take into consideration whether or not the parties were represented or afforded the right to be present and to cross examine the witness.

§ 137.20–140 Testimony by deposition.

(a) Testimony may be taken by deposition upon application, and for good cause shown, by any party or upon the initiative of the examiner.

(b) The application to the examiner shall be in writing, setting forth the reasons why it should be taken, the name and address of the witness, the matters concerning which it is expected the witness will testify, the time and place proposed for the taking of the deposition and whether it shall be by oral examination or written interrogatories.

(c) The examiner will for good cause shown, serve upon the parties an order specifying the name of the witness, the time and place for taking the deposition, and a designation of a person before whom the witness is to testify. Such deposition may be taken before any person authorized to administer oaths.

(d) The party desiring a deposition by written interrogatories shall submit a list of interrogatories to be propounded to the absent witness; then the opposite party after he has been allowed a reasonable time for this purpose, may submit a list of cross-interrogatories. If either party objects to any question, the matter shall be presented to the examiner for a ruling. Upon agreement of the parties on a list of interrogatories and cross-interrogatories (if any) the examiner may propound additional questions.

(e) The subpena referred to in Subpart 137.15, of this part together with the list of interrogatories and cross-interrogatories (if any), shall be forwarded to the person designated to take such deposition. This person will cause the subpena to be served personally on the witness, and a copy shall be endorsed and returned to the examiner.

(f) When the deposition has been transcribed, it shall be presented to the witness for examination and correction and then shall be subscribed by him. The person taking the deposition shall certify the signature of the witness. If for any reason the deposition or interrogatory is not subscribed by the witness, then the person taking the deposition shall recite under oath thereon the reason it is not subscribed.

(g) When the deposition has been duly executed it shall be returned to the examiner. As soon as practicable after the receipt of the deposition the examiner shall present it to the parties for their examination. The examiner shall rule on the admissibility of the deposition or any part thereof and on any objections.

(h) In the event one party files interrogatories, the other party, in lieu of filing cross-interrogatories, may attend the taking of the deposition and cross-examine the witness.

§ 137.20–145 Argument.

(a) After all the evidence has been presented the parties may present oral and/or written argument in the following order:

(1) Opening argument by the investigating officer;

(2) Argument by the person charged or his counsel; and,

(3) Closing argument by the investigating officer.

§ 137.20–150 Submission of proposed findings and conclusions.

(a) The examiner shall afford the investigating officer and the person charged reasonable opportunity to submit, either orally or in writing, proposed findings and conclusions with supporting reasons. If either party desires to submit such matter, the examiner shall fix the time within which it shall be filed. Failure to comply within the time so fixed by the examiner shall be regarded as a waiver of the right.

§ 137.20–155 Examiner's decision.

(a) The examiner shall render a decision consisting of:

(1) "Findings of Fact," including necessary evidentiary and ultimate facts pertaining to each specification;

(2) "Conclusions" as to whether or not the charges and specifications are found proved;

(3) "Rulings" on proposed findings and conclusions;

(4) "Opinion," discussing the reasons, precedents, legal authorities, or other basis for the findings, conclusions and order on all material issues of fact, law, or discretion, with such specificity as to advise the parties of their record and legal basis; and,

(5) "Order," reciting disposition of the case. The order is only given after consideration of the prior record of the person charged as provided in § 137.20–160.

(b) A separate conclusion shall be made by the examiner on each charge and specification. A specification may alternately be found "not proved," "proved in part," "proved," or "proved by plea."

§ 137.20–160 Prior record.

(a) Except as provided for in § 137.20–118, the prior commendatory and/or disciplinary record of the person charged will not be disclosed to the examiner until after he has made the conclusions as to each charge and specification, and then only if at least one charge has been found "proved."

(b) In order to expedite the examiner's decision, if prior record is not available at the hearing, the person charged, if he consents, may be questioned under oath as to his prior record. Erroneous information given by the person charged shall be grounds for the examiner to reopen the case and amend his order.

§ 137.20–165 Table of average orders.

(a) The Table 137.20–165 is for the information and guidance of examiners. The orders listed for the various offenses are average only and should not in any manner affect the fair and impartial adjudication of each case on its individual facts and merits.

(b) The Table 137.20–165 is divided into seven groups. In the table, the first numeral indicates the period of suspension in months and when followed by a zero means an outright suspension. For example, 1–0 means a one-month suspension without probation. Where the first numeral is followed by a numeral other than zero, a probationary suspension is indicated. For example, 6–12 means a six-month suspension, with a twelve-month period of probation.

TABLE 137.20–165—SCALE OF AVERAGE ORDERS

Type of Offense	Number of times committed				
	First	Second	Third	Fourth	Fifth
Group A (1) (offenses committed within 3 years are to be considered as repeated):					
Absent over leave	[1] Adm.	1–0	3–0	6–0	[2] Rev.
Absent without leave	Adm.	1–0	3–0	6–0	Rev.
Failure to join (domestic)	Adm.	1–0	3–0	6–0	Rev.
Inattention to duty (unintentional)	Adm.	1–0	3–0	6–0	Rev.
Violation of a regulation (unintentional)	Adm.	1–0	3–0	6–0	Rev.
Group A (2) (offenses committed within 3 years are to be considered as repeated):					
Creating a disturbance aboard ship due to intoxication	Adm.	2–0	4–0	Rev.	
Failure to join (foreign)	Adm.	2–0	4–0	Rev.	
Failure to perform duty	Adm.	2–0	4–0	Rev.	
Group B (time between offenses not to have any bearing when considering whether man is repeater):					
Attempt to illegally take or smuggle property ashore	6–12	6–0	Rev.		
Desertion (domestic)	6–12	6–0	Rev.		
Failure to report marine casualty	6–12	6–0	Rev.		
Failure to manifest	6–12	6–0	Rev.		
Neglect of duty	6–12	6–0	Rev.		
Possession of intoxicating liquor	6–12	6–0	Rev.		
Possession of firearms	6–12	6–0	Rev.		
Sleeping on watch	6–12	6–0	Rev.		
Use of profane and threatening language to superior	6–12	6–0	Rev.		
Violation of a regulation (intentional)	6–12	6–0	Rev.		
Wilful disobedience of a lawful order	6–12	6–0	Rev.		
Group C (time between offenses not to have any bearing when considering whether man is repeater):					
Assault	1–0	4–0	Rev.		
Group D (time between offenses not to have any bearing when considering whether man is repeater):					
Inattention to duty (intentional)	3–0	12–0	Rev.		
Illegal possession of cargo or ship's property	3–0	12–0	Rev.		
Neglect of duty; damage to vessel, cargo or personnel (ordinary negligence)	3–0	12–0	Rev.		
Pilfering cargo or ship's equipment	3–0	12–0	Rev.		
Refusing to perform duty	3–0	12–0	Rev.		
Sale of ship's property	3–0	12–0	Rev.		
Theft	3–0	12–0	Rev.		
Group E (time between offenses not to have any bearing when considering whether man is repeater):					
Assault and battery	6–0	Rev.			
Assault with dangerous weapon (no injury)	6–0	Rev.			
Destruction of ship's cargo or property	6–0	Rev.			
Desertion (foreign)	6–0	Rev.			
Continued disobedience of lawful order	6–0	Rev.			
Embezzling ship's cargo or property	6–0	Rev.			
Neglect of duty; damage to ship, cargo or persons (gross or wilful)	6–0	Rev.			
Interference with master, ship's officer, or Government official in performance of official duties	6–0	Rev.			
Smuggling of property	6–0	Rev.			
Sale of intoxicating liquor	6–0	Rev.			
Group F:					
Assault with dangerous weapon (injury)	Rev.				
Malicious destruction of ship's property	Rev.				
Misconduct resulting in loss of life or serious injury	Rev.				
Molestation of passengers	Rev.				
Murder or attempted murder	Rev.				
Mutiny	Rev.				
Perversion	Rev.				
Possession, use, sale or association with drugs, including marijuana	Rev.				
Sabotage	Rev.				
Serious neglect of duty	Rev.				
Serious theft of ship's property or stores	Rev.				
Smuggling of aliens	Rev.				

[1] Abbreviation for "Admonition."
[2] Abbreviation for "Revocation."

§ 137.20–170 Order.

(a) If no charge is found "proved," the order of the examiner shall state that the charge or charges are "dismissed."

(b) If a charge is found "proved," the examiner shall order an admonition, suspension with or without probation, or revocation.

(c) An order shall be directed against all licenses, certificates, and/or documents, except that in cases of negligence or professional incompetence, the order may be made applicable to specific licenses or documents in qualified ratings.

(d) When an examiner determines that the person charged is professionally incompetent in the grade of the license, certificate or document he holds, but is considered competent in a lower grade, the examiner may revoke the license, certificate or document and order the issuance of one of a lower grade.

(e) In a decision rendered in the United States, an order of revocation or outright suspension shall direct the person charged to surrender his license, certificate and/or document immediately. Any domestic order should state that it is effective on service and that the license, certificate and/or document affected is:

(1) Revoked; or,

(2) Suspended outright until a specified period after surrender; or,

(3) Suspended for a specified period subject to a specified period of probation; or,

(4) A combination of subparagraph (2) of this paragraph and a probationary suspension, as indicated in subparagraph (3) of this paragraph, extending from the beginning of the outright suspension until a specified period after the termination of the outright suspension.

(f) In a decision rendered outside of the United States, an order shall differ only in that a revocation or outright suspension is not to be effective until the date of arrival of the person charged in the United States.

§ 137.20–175 Delivery of order and complete decision.

(a) Whenever possible, the examiner shall prepare in writing his complete decision, including the order, and personally deliver it to the person charged or his authorized representative at the final session of the hearing. The decision, including the order, is effective on the date of such delivery.

(b) If it is not possible for the examiner to deliver his complete written decision at the final session of the hearing, he shall render his oral decision on the record, then prepare the order in writing and personally deliver it to the person charged or his authorized representative. The decision, including the order, is effective upon such delivery of the written order. When the written decision is available, the examiner will cause it to be delivered to the person charged or his authorized representative.

(c) If it is not possible for the examiner at the conclusion of the hearing to render an oral decision on the record and to follow the procedures provided for in paragraph (a) or (b) of this section, the written decision, including the order, shall be delivered to the person charged or his authorized representative, at the earliest possible date, either personally or by certified mail with return receipt required to be signed only by the person charged or his authorized representative. The signed acknowledgement or the affidavit of personal delivery, or the return receipt shall be made a part of the record and shall determine the effective date of the decision, including the order, unless good cause is shown why this date should not apply.

(d) As used in this section, the phrase "authorized representative" means any person who has been authorized, as shown by the hearing record, to receive service and take an appeal on behalf of the person charged.

§ 137.20–180 Notification of right to appeal.

(a) The person charged shall be advised by the examiner of his right to appeal in accordance with Subpart 137.30 of this part. The examiner shall also advise the person charged that if such appeal is not taken within the time limit specified in Subpart 137.30 of this part it will not be accepted.

§ 137.20–185 Completion of the hearing.

(a) Upon completion of the procedures in this subpart, the hearing is completed.

§ 137.20–190 Modification of examiner's order and decision.

(a) After an examiner renders his order and decision, it may be modified or changed pursuant to procedures set forth in paragraph (b) of this section, or in Subpart 137.25 of this part for reopening of hearings, or in Subpart 137.30 of this part for appeals, or in Subpart 137.35 of this part for review of examiner's decisions. In the absence of any such procedures, the decision of the examiner is final and binding.

(b) When the proceeding under the provisions of Title 46, U.S. Code, section 239b, is based on a narcotics conviction as referred to in § 137.03–10, rescission of the revocation of a license, certificate or document will not be considered, unless the applicant submits a specific court order to the effect that his conviction has been unconditionally set aside for all purposes. The Commandant reserves the personal right to make the determination in such case.

Subpart 137.25—Reopening of Hearings

§ 137.25–1 Petition to reopen hearing.

(a) At any time prior to a final decision on appeal or within one year from the date of service of the examiner's decision, a person found guilty of any offense may petition to reopen the hearing on the basis of newly discovered evidence.

(b) If at the time the petition is filed an appeal to the Commandant from the examiner's decision has not been filed, the petition to reopen the hearing shall be considered by an examiner. If an appeal to the Commandant has been filed, the petition to reopen the hearing shall be considered by the Commandant.

§ 137.25–5 Form of petition.

(a) The petition shall be in letter form, typewritten or written in a legible hand, and addressed to the examiner or the Commandant, as appropriate.

(b) The petition shall contain the following:

(1) A descriptive identification of the hearing desired to be reopened, including place of hearing, full name of person found guilty, number and description of license and/or document involved, the name of the examiner and date of the decision.

(2) An affirmative declaration that no appeal has been taken pursuant to Subpart 137.30 of this part, or if an appeal has been taken, the date and with whom such appeal was filed.

(3) A statement setting forth why the evidence would probably produce a different result favorable to the person found guilty.

(4) A statement as to whether or not the additional evidence was known to the petitioner at the time of the hearing, and if applicable, reasons why the petitioner, with due diligence, could not have discovered such new evidence prior to the date the hearing was completed.

(5) A statement setting forth briefly and specifically:

(i) The precise nature and purpose of such additional evidence; and,

(ii) The names and addresses of persons to be called as witnesses and the time and place when such witnesses will be available to testify personally or by deposition.

§ 137.25–10 Action on petition.

(a) After the receipt of the petition, an investigating officer shall be afforded a reasonable time within which to file an answer in writing on the merits of the petition. The decision on the petition will be based on a consideration of the petition, the record of the hearing, and the answer, if any.

(b) The petition shall only be granted when new evidence is described which has a direct and material bearing on the issues, and when valid explanation is given for the failure to produce this evidence at the hearing.

(c) The examiner or the Commandant shall render a decision in writing, either granting or denying the petition.

(d) If the examiner grants the petition, he shall reopen the hearing to permit the offer of new evidence described in the petition.

(e) If the petition is granted by the Commandant, he will remand the case to an examiner with directions to reopen the hearing.

(f) On the basis of the record of the original hearing and the new evidence received, the examiner shall either affirm the original decision or withdraw the original decision and render a new one.

(g) The petition, and answer, if any, the examiner's or Commandant's decision, and the additional evidence will be added to the original record.

(h) The filing of a petition to reopen the hearing shall not stay an existing order of the examiner.

(i) If a petition to reopen a hearing is filed within 30 days after the service of the examiner's decision, it will toll or defer the running of the 30-day statutory period of appeal as provided in Subpart 137.30 of this part until an examiner has acted on the petition.

§ 137.25–15 Appeal from action on petition.

(a) If the petition to reopen the hearing is denied by the examiner, the per-

son found guilty may appeal to the Commandant within 30 days from the date of service of the denial of the petition. The review by the Commandant on this appeal will be limited to the issue raised by the petition. Other grounds for appeal must be in accordance with Subpart 137.30 of this part.

(b) If the petition to reopen the hearing is granted and a previous finding of "proved" is affirmed by the examiner, the person found guilty may appeal the decision as provided for in Subpart 137.30 of this part.

Subpart 137.30—Appeals

§ 137.30–1 Time for filing, contents, etc.

(a) A person found guilty by an examiner may, within 30 days after the date of the order of the examiner is effective, take an appeal to the Commandant. This appeal shall be taken by filing a notice of appeal with the District Commander of the district in which the hearing was held.

(b) The notice of appeal shall:

(1) Be typewritten or written legibly;

(2) Be addressed to the Commandant; and,

(3) Set forth the name of the appellant, the number and description of license, and/or document involved, nature of the charge, the order, and the examiner who made the decision.

(c) The notice of appeal may contain a statement of grounds for appeal and/or exceptions. The appellant may file with the notice of appeal a brief or memorandum in elaboration of the matters set forth in the notice of appeal. The notice of appeal may contain a request for transcript of the hearing. No request for such transcript will be accepted unless it is submitted with the notice of appeal.

(d) The District Commander shall transmit this material and a complete transcript of the hearing to the Commandant.

(e) After the appellant or his counsel has received a transcript of the record, any exceptions submitted shall be identified by specific citations to pages in the transcript and shall contain legal and other authorities relied upon to support such exceptions.

(f) The only matters which will be considered by the Commandant on appeal are:

(1) Exceptions properly raised by the appellant as indicated in paragraph (e) of this section;

(2) Clear errors in the record; and,

(3) Jurisdictional questions.

(g) In the preparation of an appeal, neither the investigating officer nor the examiner will assist the appellant beyond the point of informing him of the proper form to be used and the applicable regulations.

§ 137.30–3 Time in which to complete appeal.

(a) Appellant may submit grounds for appeal and exceptions to the examiner's decision, whether or not any such matter was filed with the notice of appeal. This matter must be submitted within 60 days after receipt of the transcript of the hearing record, or, if no transcript was requested, within 60 days of the date of effective service of the decision. Nothing further will be received and considered as a part of the appeal record after the applicable time has elapsed unless it is extended by the Commandant.

(b) Prior to the expiration of the applicable 60-day period of extension thereof as set forth in paragraph (a) of this section, at least one ground for appeal or exception to the examiner's decision must be filed in support of the notice of appeal. Failure to do so will result in one of the following:

(1) Termination of the case by written notice to the appellant or his counsel, that the decision of the examiner constitutes the final agency action on the merits of the case; or,

(2) Consideration of the appeal on the merits of the case and publication of the Commandant's decision without prior notice to the appellant or his counsel. This will only be done when some clear error appears in the record, or when the case presents some novel policy consideration.

§ 137.30–5 Record for decision on appeal.

(a) The transcript of hearing, together with all papers and exhibits filed, shall constitute the record for decision on appeal.

§ 137.30–10 Action on appeal.

(a) The Commandant may affirm, reverse, alter, or modify the decision of the examiner, or he may remand the case for further hearing. The decision of the Commandant on appeal shall be final in the absence of a remand.

§ 137.30–15 Temporary documents.

(a) Any person who has appealed from a decision suspending or revoking his document may file a written request for a temporary document with the Examiner who rendered the decision or with any Officer in Charge, Marine Inspection, for forwarding to such Examiner. The request will be granted by the Examiner except (1) when the hearing transcript has been forwarded to the Commandant, or (2) when, in the opinion of the Examiner, the order of suspension or revocation rests upon a finding of guilty for a serious offense of such a character that the presence of the person charged on board a vessel, either immediately or for the indefinite future, would be incompatible with the requirements of safety of life or property at sea, or for a serious offense found by the Examiner to have been committed willfully.

(b) If the transcript has been forwarded to the Commandant, or if the request is denied by the Examiner, the request shall be forwarded by the Examiner to the Commandant for final action. A temporary document may be issued in the discretion of the Commandant, except where such action, in the opinion of the Commandant, would be incompatible with the requirements of safety of life or property at sea.

(c) A temporary document shall be subject to such terms and conditions as the Commandant or Examiner may prescribe. However, all such documents shall provide that they expire not more than six months after issuance or upon service of the Commandant's decision on appeal, whichever occurs first. If a temporary document expires before the Commandant's decision is rendered, it may be renewed, after authorization by the Commandant, by the issuance of a new temporary document by an Officer in Charge, Marine Inspection.

(d) Copies of the temporary documents issued shall become a part of the record on appeal.

§ 137.30–20 Appeal cases remanded for further proceedings.

(a) When the Commandant renders a decision remanding a case for further proceedings, the remand is directed to the examiner. The examiner shall notify the parties and set a date for continuance of the proceedings. In the absence of specific directions from the Commandant, the examiner shall either reopen the former hearing or conduct a new hearing.

(b) If the hearing is reopened, the evidence in the prior hearing shall be evaluated together with the new evidence submitted.

(c) In a new hearing, the evidence in the prior hearing may be used for purposes of impeachment. Evidence in the prior hearing may be stipulated as a part of the record of the new hearing.

(d) The examiner shall render either an entirely new decision or a decision incorporating by reference his original decision as necessary.

Subpart 137.35—Review of Examiners' Decisions in Guilty Cases

§ 137.35–1 Commandant's review.

(a) Any decision of an examiner, in which there has been a guilty finding, may be called up for review by the Commandant on his own motion or direction, within sixty (60) days, after the decision is announced or has been made effective, whichever date is later. On occasion, such action may be taken upon recommendation of the District Commander within whose jurisdiction the decision of the examiner was announced. As used in the regulations in this part the phrase, "on his own motion" means by the Commandant's direction or order, without other procedural formality.

(b) The processes in effect with respect to the preparation and presentation of the record on appeals by merchant seamen, shall apply to the consideration of cases brought up on review by the Commandant.

§ 137.35–5 Record for decision on review.

(a) The transcript of hearing, together with all papers and exhibits filed, shall constitute the record for consideration on review.

§ 137.35–10 Scope of review.

(a) The review will be restricted to questions of law, fact, and policy.

§ 137.35–15 Action on review.

(a) In no case will the review by the Commandant be followed by any order increasing the severity of the examiner's original order.

(b) The Commandant may adopt in whole or in part the findings, conclusions, and basis therefor stated by the examiner, or he may make entirely new findings on the record, or he may remand the case to the examiner for further proceedings.

(c) The decision of the Commandant, on review, shall be final in the absence of a remand.

Subpart 137.50—Disclosure of Information

§ 137.50–1 Public information.

(a) Upon inquiry information may be released as to whether an investigation of a specified complaint is in progress, or that charges have been preferred, or that an investigation has been closed.

(b) Upon inquiry information may be released as to scheduled times of hearings and the substance of charges to be considered.

(c) Upon inquiry information disclosed at public hearings before examiners may be released so long as the cases have current public interest. Such information regarding cases no longer having current public interest will not be released unless otherwise provided for in this subpart or Subpart 137.55 of this part.

§ 137.50–5 Public records.

(a) There shall be maintained as public records available for inspection at Coast Guard Headquarters, in each district office, and in each marine inspection office, a file of the Commandant's Decisions on Appeal or Review.

(b) There shall be maintained as public records available for inspection at Coast Guard Headquarters a file of the decisions of examiners.

(c) There shall be maintained as public records available for inspection in the Office of the District Commander a file of copies of decisions of examiners rendered within such district.

§ 137.50–10 Administrative records.

(a) All files, records, testimony, documents, reports, or other data pertaining to an investigation to determine whether or not a hearing should be instituted, are administrative records. They are not public records available for inspection.

Subpart 137.55—Release of Records

§ 137.55–1 Public records.

(a) Upon written application, copies of public records referred to in Subpart 137.50 of this part may be obtained by persons properly concerned because of litigation or other reasonable collateral interest in the proceedings.

§ 137.55–5 Hearing transcript to appellant.

(a) A copy of the complete hearing transcript will be given to an appellant when it is requested in accordance with § 137.30–1.

§ 137.55–10 Hearing transcript to other persons.

(a) Upon written application, a complete copy of, or excerpts from, a hearing record may be obtained by persons properly concerned because of litigation or other reasonable collateral interest in the proceedings: *Provided*, That the record has been transcribed and copies are available.

§ 137.55–15 Written applications.

(a) A written application required by this subpart shall be addressed to the person in charge of the office where such records are maintained. The application shall be made by the party desiring the record or his authorized representative and shall:

(1) Identify the applicant (submit proof if representing another person);

(2) Specify the material desired;

(3) State the reason for the request; and,

(4) State whether or not the material is intended for use in litigation involving the United States.

§ 137.55–20 Action on written applications.

(a) The person to whom a written application for the release of records is addressed shall comply with the request if it meets the requirements of this subpart. Otherwise, the request shall be denied or, in doubtful cases, referred to the Commandant for determination.

§ 137.55–25 Authorized representatives.

(a) When the release of records is provided for in this subpart, such records may be obtained by an agent or attorney whose authority to act on behalf of another person is established by:

(1) A signed statement by the party represented; or,

(2) A statement, on the hearing record, by the party represented; or,

(3) A copy of a contract of retainer signed by the party represented.

(b) When the release of records is provided for in this subpart, such records may be obtained by an executor, administrator, heir, guardian, trustee or other legal representative of a deceased or incompetent person: *Provided*, That proof of the relationship is submitted.

§ 137.55–30 Production upon compulsory process.

(a) When a request for records is denied for any reason, the applicant shall be advised that the records may be obtained by service of a subpena duces tecum or an order from a court of competent jurisdiction. However, if the information desired is classified for security reasons or by virtue of a specific law or executive order the applicant shall also be advised that such subpena or court order should be addressed to the Commandant.

§ 137.55–35 Persons directly concerned.

(a) Appellants in these proceedings are the only persons considered to be directly concerned and, therefore, entitled to free copies of these records as a matter of right upon proper request.

§ 137.55–40 Costs.

(a) The release of records authorized by this subpart shall be subject to the payment of costs prescribed in 33 CFR 1.25 with the exception of hearing transcripts furnished to appellants.

Subpart 137.60—Persons in Service of Coast Guard

§ 137.60–1 Testimony by Coast Guard personnel.

(a) Except as provided in paragraph (c) of this section, no person in the service of the Coast Guard shall, without prior approval of the Commandant, give any testimony with respect to any investigation or any other official proceedings in any suit or action in the courts. This applies equally to cases in State or Federal courts and to civil as well as criminal cases.

(b) In cases involving (1) civil litigation between private parties; or, (2) criminal matters before State courts; or, (3) civil litigation for or against the United States where Coast Guard personnel are called by parties opposing the United States; an affidavit by the litigant or his attorney setting forth the interest of the litigant and the information with respect to which the testimony of such Coast Guard officer or employee is desired must be submitted before permission to testify will be granted. Permission to testify will, in all cases, be limited to the information set forth in the affidavit, or to such portions thereof as may be deemed proper. In addition to the permission required by this paragraph, the Commandant may insist that the appearance of the Coast Guard officer or employee as a witness be conditioned on the issuance of a subpena or subpena duces tecum (as appropriate) from a court of competent jurisdiction.

(c) In cases where the appearance of Coast Guard personnel is desired by counsel representing the United States to support the affirmative claims or defenses of the United States in civil matters or on behalf of the United States in criminal matters, no affidavit as described in paragraph (b) of this section shall be required, but the Commandant's prior approval must be nevertheless obtained, except in those cases where the Coast Guard personnel desired as witnesses file the original complaint or have made original inquiry into the subject matter which resulted in the filing of an original complaint.

SUBCHAPTER L—OVERTIME SERVICES

PART 143—EXTRA COMPENSATION FOR OVERTIME SERVICES

Sec.

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AUTHORITY: The provisions of this Part 143 issued under R.S. 4462, as amended; 46 U.S.C. 416. Interpret or apply sec. 6, 49 Stat. 1385, as amended; 46 U.S.C. 382b. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521.

§ 143.1 Extra compensation; Coast Guard civilian personnel.

Civilians assigned to the duties formerly assigned to local inspectors and their assistants, United States shipping commissioners and their deputies and assistants prior to Reorganization Plan No. 3 of 1946 (3 CFR, 1946 Supp.), and customs officers and employees, while performing duties in connection with the inspection of vessels or their equipment, supplying or signing on or discharging crews of vessels, at night or on Sundays and holidays, shall receive extra compensation to be paid by the master, owner, or agent of the vessel to the local United States collector of customs or his representative. (See § 143.16.)

§ 143.2 Payment although no actual service performed.

The rates of extra compensation are payable in cases where the services of officers or employees have been duly requested and the officers or employees have reported for duty, even though no actual service may be performed.

§ 143.3 Overtime earnings not basis for overtime under Federal Employees Pay Act of 1945.

Overtime, Sunday, and holiday services which are covered by payments under this part shall not also form a basis for overtime or extra pay under the Federal Employees Pay Act of 1945.

§ 143.4 Waiting time; actual report for duties.

Extra compensation for "waiting time" will not be allowed unless and until an officer or employee actually reports for duty.

§ 143.5 Night, Sunday, and holiday defined.

(a) For the purpose of this part the word "night" shall mean the time between 5 p.m. of any day and 8 a.m. of the following day.

(b) The term "holiday" shall mean only national legal public holidays, viz., January 1, February 22, May 30, July 4, the 1st Monday in September, November 11, the 4th Thursday in November, December 25, and such other days as may be declared legal public holidays by an act of Congress or by an Executive order of the President of the United States.

(c) The term "Sunday" shall include the first day of each calendar week.

§ 143.6 Rate for night service.

The rate of extra compensation for authorized overtime services performed at night on any week day is hereby fixed at one-half the gross daily rate of regular pay of the employee who performs the services for each 2 hours of compensable time, any fraction of 2 hours amounting to at least one hour to be counted as 2 hours. In computing the amount earned, each 2 hours is the time period for the purpose of computation, at least one hour means the minimum service in each period for which extra pay may be granted. If service continues beyond a 2 hour period, it must extend for at least one hour into the following 2 hour period to be entitled to extra pay for the second period. When the overtime extends beyond 5 p.m., payment of extra compensation from 5 p.m., for services consisting of at least one hour is authorized, even though such services may not actually begin until 7 p.m., 9 p.m., or later: *Provided*, That the officer rendering the service remained on duty from 5 p.m., in which case the time between 5 p.m., and the time of beginning the actual service shall be computed as waiting time; and where the actual services begin as late as 9 p.m., there should be an affirmative statement that the officer was required to remain on duty between 5 p. m., and 9 p. m., if a charge for waiting time is made. The maximum amount of extra compensation which may be paid an employee for services during one night shall not exceed two and one-half times the gross daily rate of his regular pay.

§ 143.7 Rate for Sunday or holiday services.

The rate of extra compensation for Sunday or holiday services is hereby fixed at twice the gross daily rate of regular pay of the employee who performs the service, for any and all services totaling an aggregate of not more than nine hours, with one hour for food and rest, during the 24 hours from midnight to midnight of the Sunday or holiday including actual waiting time and time required for travel between posts of duty but not including other time not spent at the post of duty. This rate shall apply regardless of the length of time served within the aggregate of the aforesaid 9 hours, whether it is served continuously or in broken periods, and whether it is served for one or more applicants. Services in excess of an aggregate of the aforesaid 9 hours performed during the 24 hours of a Sunday or holiday shall be compensated on the same basis as overtime services performed at night on a week day, the time between the completion of the aggregate of the aforesaid 9 hours and midnight being considered as the hours of a night. The maximum amount which may be paid an employee for services performed during the 24 hours of a Sunday or holiday shall not exceed four and one-half times the gross daily rate of his regular pay.

§ 143.8 Broken periods.

In computing extra compensation where the services rendered are in broken periods and less than 2 hours intervene between such broken periods, the time served should be combined with the waiting time and computed as continuous service.

§ 143.9 Two hours between broken periods.

Where 2 hours or more intervene between broken periods, one-half day's extra pay will be allowed for each distinct 2-hour period or part of a 2-hour period, if waiting time and actual service rendered within each period consists of at least 1 hour.

§ 143.10 Waiting time.

The same construction should be given the act when charging for waiting time as governs the charge for services actually rendered. No charge should be made unless after having reported for duty the waiting time amounts to at least one hour.

§ 143.11 Proration of charges.

If services are performed for two or more applicants during one continuous tour of overtime duty, the charge for the extra compensation earned shall be prorated equitably according to the time attributable to the services performed for each applicant.

§ 143.12 Travel status overtime.

When employees are in travel status, overtime shall apply the same as at official station.

§ 143.13 Congressional appropriations necessary.

Payment of extra compensation for overtime services shall be subject to appropriations being made therefor by Congress.

§ 143.14 Assessment and collection of fees.

Assessment and collection of fees against steamship companies for overtime services shall be made even though the payment to employees for such services may not be made until funds are appropriated for that purpose.

§ 143.15 Application form.

An application on a form prescribed by the Commandant of the Coast Guard, shall be filed with the office being requested to furnish overtime services before such assignment can be made.

§ 143.16 Billing for services.

Overtime services shall be billed to the steamship companies on collection voucher provided for that purpose. Remittance shall be made by postal money order or certified check payable to the "Collector of Customs, Treasury Department" and forwarded to that officer at the port indicated on the voucher, who shall in turn deposit such remittance to a properly designated receipt account.

§ 143.17 Protests.

Protests against the exaction of extra compensation shall be forwarded to the Commandant of the Coast Guard.

SUBCHAPTER M—BULK GRAIN CARGOES

PART 144—LOADING AND STOWAGE OF GRAIN CARGOES

Subpart 144.01—Preface

Sec.
144.01–1 Purpose.

Subpart 144.10—General Requirements

144.10–1 Scope.
144.10–10 Application to vessels.
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144.10–40 Uprights.
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144.10–70 Feeders, bins, and bulkheads.
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144.10–90 Equivalents.
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Subpart 144.20—Detailed Loading and Stowage Requirements

144.20–1 Trimming and filling.
144.20–2 Bagged grain.
144.20–10 Stowage of full holds and compartments.
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144.20–24 Exceptions to the requirements for longitudinal bulkheads.
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144.20–28 Common loading.
144.20–30 Bulk grain in tween decks and superstructures.
144.20–32 Stowage of specially suitable ships.
144.20–34 Stability conditions.
144.20–36 Grain loading plans.

Subpart 144.30—Vessels Shifting Ports

144.30–1 Shifting vessels with part cargoes of loose grain in bulk.

AUTHORITY: The provisions of this Part 144 issued under R.S. 4405, as amended, 4462, as amended, sec. 632, 63 Stat. 545; 46 U.S.C. 375, 416, 14 U.S.C. 632. Interpret or apply R.S. 4417, as amended, 4426, as amended, sec. 1, 49 Stat. 1544, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 404, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 144.01—Preface

§ 144.01–1 Purpose.

(a) The purpose of the regulations in this subchapter is to promote safety in the handling, stowage and transportation of grain on board vessels within the limits of the jurisdiction of the United States, including its territories and possessions excepting only the Panama Canal Zone, and to make more effective the provisions of the International Convention for Safety of Life at Sea, 1960, relative to the carriage of grain.

Subpart 144.10—General Requirements

§ 144.10–1 Scope.

(a) The regulations in this part contain the minimum requirements for the handling, stowage, and transportation of loose grain in bulk on board vessels.

§ 144.10–10 Application to vessels.

(a) Except as specifically provided otherwise in this section, the regulations in this part apply to every cargo vessel of 500 gross tons or over and every passenger vessel, which:

(1) Loads loose grain in bulk within the limits defined in § 144.01–1(a) for an ocean or coastwise voyage, including such a voyage originating at a United States Great Lakes grain loading port; or,

(2) Is of United States registry and carries loose grain in bulk on an ocean or coastwise voyage, including such a voyage originating at a Great Lakes grain loading port.

(b) The regulations in this part do not apply to vessels engaged on voyages solely between ports within the limits of the Great Lakes and the St. Lawrence River as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island, and on the north side of Anticosti Island following the 63d meridian.

§144.10–20 Definitions.

(a) For the purpose of the regulations in this part the definitions in this section shall apply.

(b) "Grain" shall include wheat, maize (corn), oats, rye, barley, rice, pulses, and seeds.

(c) "Light grain" means oats, light barley or cottonseed.

(d) "Light barley" means barley which weighs:

(1) 50 pounds or under per full bushel of 1.2445 cubic feet (U. S. A.); or,

(2) 51.575 pounds or under per full bushel of 1.2837 cubic feet (U. K.).

(e) "Heavy grain" means all grain other than oats, light barley, or cottonseed.

(f) "Bin" means a section of the cargo space in the 'tween decks or superstructure completely enclosed on all sides.

§ 144.10–25 Certification by National Cargo Bureau, Inc.

(a) Certificates of loading of the National Cargo Bureau, Inc., may be accepted as prima facie evidence of compliance with the requirements in this subchapter.

§ 144.10–30 Shifting boards.

(a) Shifting boards shall be of good sound timber of minimum thickness of 2 inches, and fitted grain-tight.

(b) The maximum unsupported span to be allowed for shifting boards of various thicknesses shall be as set forth in Table 144.10–30 (b).

TABLE 144.10–30 (b)

Thickness	Span	Housing of bulkhead
		Inches
2-inch planks.....	Unsupported span not to exceed 8 feet.	3
2½-inch planks...	Unsupported span not to exceed 11 feet.	3
3-inch planks.....	Unsupported span not to exceed 13 feet.	3

(c) Shifting boards shall be securely housed at bulkheads, and where permanent angle bars are not available for this purpose, wood cants shall be fitted not less than 6 inches in width and 3 inches in thickness and suitably shored.

(d) Where 2½ inch or 3 inch shifting boards are used the boards may be butt-jointed in way of the uprights and at least 4 inches of plank shall be supported. Where 2 inch shifting boards are used the joints shall overlap by at least 9 inches in way of the uprights.

(e) Where no special arrangements are made for grain-tight filling between the beams, wood filling pieces of the same thickness as the shifting boards shall be fitted grain tight between the beams, and shall be secured in place by cleats or scabs at both ends and fitted both sides. The cleats or scabs shall be at least 2 inches by 4 inches and shall extend the full depth of the filling piece and to an equal distance thereunder, and shall be securely spiked or bolted to the shifting boards and filling pieces.

§ 144.10–40 Uprights.

(a) Uprights shall be of wood or steel.

(b) Wood uprights shall not be less than 10 inches in width and 2 inches in thickness.

(c) Uprights shall be cleated to the tanktop or ceiling where fitted, and when an upright is not securely housed at the top the uppermost supporting shores or stay shall be not more than 18 inches below the deck or top of the upright.

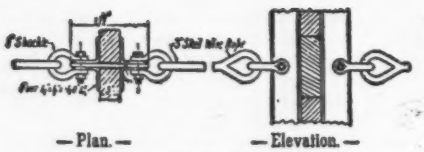
(d) (1) Where a tier of closely spaced pillars in a hold or compartment is utilized for supporting the shifting boards at the middle line, the sizes of the pillars shall be in accordance with the rules of approved classification societies for deck beam pillars.

(2) Where the pillars are not reeled or staggered, additional support shall be provided by means of hook-bolts and vertical tieplates or uprights secured to the pillars. Such tieplates shall consist of plates not less than 3 inches in width and ½ inch in thickness and shall be through-bolted at intervals of not more than 3 feet.

(e) The horizontal distances between the centers of uprights shall be specified in § 144.10–30 (b). Wood uprights used in association with wire stays, spaced as in § 144.10–60, shall be not less than 11 inches in width and 3 inches in thickness.

(f) The construction and dimensions of angle bar uprights used in association with wire stays shall conform to, or be equivalent to, the following:

(1) *Type I.* Each upright shall consist of 4 angle bars 4 by 4 by 0.40 inches and steel plate 11½ inches wide by .50 inch thick riveted to form one complete structure allowing 4-inch housings on both forward and after sides. Equivalent brackets riveted to head and heel shall be fitted, each to take five ⅞-inch bolts with corresponding lugs and/or angles on tank top, tunnel top, and hatch webs. See Figure 144.10–40 (f) (1) for illustration.



— Plan. — — Elevation. —

FIGURE 144.10-40 (f) (1)

(2) *Type II.* Metal uprights in accordance with Table 144.10-40 (f) (2). Vertical angle bars shall be connected at head and heel to the tank top, tunnel top, deck beams, and hatch webs by angle lugs having two ⅞-inch bolts in each angle bar upright and equivalent fastenings to tanktop, tunnel top, deck beams, and hatch webs. The vertical angle bars shall be bolted together through the shifting boards by ⅞-inch bolts not more than 4 feet apart. See figure 144.10-40 (f) (2) for illustration with overlap of shifting boards.

TABLE 144.10-40 (f) (2)

Horizontal distance between centers of uprights	Vertical spans supported by each stay	Sizes of angle bars
	Feet	*Inches*
8' (2" shifting boards)	8	3 x 3 x 0.38
8' (2" shifting boards)	11	3½ x 3½ x 0.38
8' (2" shifting boards)	14	4½ x 3½ x 0.44
11' (2½" shifting boards)	8	3 x 3 x 0.38
11' (2½" shifting boards)	11	4 x 3½ x 0.40
11' (2½" shifting boards)	14	6 x 3½ x 0.40
13' (3" shifting boards)	8	3 x 3 x 0.38
13' (3" shifting boards)	11	4 x 3½ x 0.42
13' (3" shifting boards)	14	6 x 3½ x 0.40

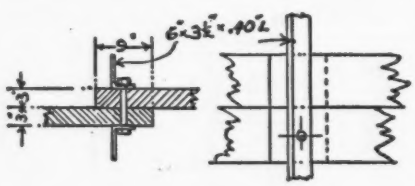


FIGURE 144.10-40 (f) (2).

(g) Wood uprights shall be supported by steel wire rope stays set up at the ship's side, or by wood shores securely heeled against the permanent structure of the ship, or by other approved means.

§ 144.10-50 Shores.

(a) All wood shores shall be of good sound timber in a single piece. Spliced shores shall not be used.

(b) The vertical spacing of wood shores shall be as follows:

(1) Except as provided in § 144.10-40 (c), the uppermost shore shall be not more than 7 feet below the top of the upright and succeeding shores shall be spaced 7 feet apart measured vertically from the uppermost shore downwards, except that a distance of 8 feet may be allowed between the lowest shore and the heel support.

(2) Shores may be heeled on the tanktop or ceiling provided the heels are secured by cleats or cants and efficiently braced against the permanent structure.

(3) Shores shall not be heeled directly against the ship's side plating.

(c) The sizes of wood shores shall be set forth in Table 144.10-50 (c).

TABLE 144.10-50 (c)

Length of shores	Minimum sizes	
	Rectangular section	Circular section diameter
	Inches	*Inches*
Not exceeding 16 feet	4 x 6	5½
Over 16 feet and not exceeding 20 feet	6 x 6	7
Over 20 feet and not exceeding 24 feet	6 x 8	7½
Over 24 feet and not exceeding 28 feet	[1] 6 x 8	8
Over 28 feet	[1] 6 x 8	8½

[1] Securely bridged at about midlength.

(d) Where the spacings of the shores or uprights are less than those prescribed by §§ 144.10-30 (b) and 144.10-50 (b), the sizes of the shores may be reduced in proportion, and where, in special circumstances, the spacings of the shores or uprights are increased, additional strength shall be provided as may be prescribed by the District Commander of the United States Coast Guard or his authorized representative.

(e) Shores should normally be fitted at an angle not exceeding 10 degrees from the horizontal; where this angle is exceeded the next larger size of shore to that required by its length shall be used. The angle between any shore and the surface to be supported shall not exceed 45 degrees from the horizontal.

§ 144.10-60 Stays.

(a) Where uprights are secured as approved at both head and heel, one stay on each side of each upright will be accepted in holds 20 feet and under in depth, to be placed at approximately ⅓ of the distance below the deck. Where the hold is more than 20 feet deep, 2 stays on each side of each upright shall be required, the upper stays to be placed at approximately ¼ of the distance below the deck and the lower stays at half the depth of the hold. Depths shall be measured to top of floor, inner bottom or tunnnel top.

(b) Where wire stays are used the following provisions shall apply:

(1) The stays shall be of at least 3-inch circumference flexible steel wire rope and shall be fitted horizontally;

(2) The rigging screws shall be at least 1¼-inch diameter and shall be fitted in accessible positions;

(3) The shackles shall be at least 1 inch;

(4) The eye bolts through the wood or angle bar uprights shall be at least 1¼ inches;

(5) At least ⅞-inch screw bolts and nuts shall be provided as may be necessary for securing the wood uprights or steel angle bars;

(6) Eye plates of at least 1 inch thickness shall be securely riveted to the side stringers or frames, or at least 1 inch shackles passed through the frames.

(c) Where in accordance with § 144.20-20 shifting boards do not extend the full depth of the hold, the shifting boards and their uprights shall be supported or stayed as provided for in the regulations in this part or to the satisfaction of the District Commander of the United States Coast Guard or his authorized representative.

§ 144.10-70 Feeders, bins, and bulkheads.

(a) Feeders, bins, and bulkheads shall be of sufficient strength to withstand the pressure of the head of grain contained therein and shall be made grain tight. When the height of the 'tween decks is greater than normal, special attention should be given to the stiffening and support of feeders and bins.

(b) Wood feeders and bin bulkheads may be constructed:

(1) Of planks worked vertically not less than 2½-inch thickness, but where the vertical unsupported span exceeds 8 feet the thickness of the planks shall be increased, or additional stiffening fitted; or,

(2) Of studding and lined with grain-tight boards 2 inches in thickness or two 1 inch layers of shiplap, laid horizontally with broken joints. Studding where possible shall be placed inside the hatch coamings and shall be not less than 4 inches by 6 inches on edge spaced not more than 2 feet centers.

(c) Wing feeders may be constructed in a similar manner around trimming hatches. In all cases the planks at the corners shall be well secured to substantial vertical cants.

(d) Where the depth of the hatch end beams or coamings exceeds 15 inches below the surface of the deck, feeding holes shall be provided to allow the grain to flow through the coamings into the hold or 'tween decks; where the depth of the coamings below the surface of the deck exceeds 15 inches and is not more than 18 inches feeding holes 2 inches in diameter shall be provided. Where the depth exceeds 18 inches feeding holes of 3½-inch diameter shall be provided. Feeding holes shall be spaced approximately 2 feet apart.

(e) Engine room, boiler room, stokehold bulkheads and donkey boiler recesses where subjected to heat shall be sheathed with wood and made grain tight. An air space of at least 6 inches shall be left between the bulkhead and the sheathing and a box trunk ventilator 6 inches by 8 inches shall be provided from the top of the air space to a ventilator or hatchway, or other equal and approved means of ventilation adopted. Sheathing shall be supported on vertical runners spaced not more than 2 feet centers and shall consist of 2 inch planks or two thicknesses of 1 inch boards laid to break joint. Other approved means of insulation may be accepted.

(f) Feeders or bin bulkheads may be constructed of bagged grain: *Provided,* That:

(1) The bags are tightly stowed and interlocked.

(2) Whenever practicable the bags are so stowed as to engage firmly with

the vessel's sides, bulkheads, and other convenient structures. Where this is not possible, the bagged bulkheads are to be not less than 11 feet (mean) in thickness and stepped.

(3) Transverse bagged bulkheads not in way of hatchways or forming feeders but supporting grain on one side only are to be not less than 11 feet (mean) in thickness and stepped.

(4) In place of bagged grain, as required by this section, cased, baled, or other suitable cargo may be used provided it is equally strongly supported and made grain-tight with strong separation cloths.

§ 144.10–80 Security of hatches.

(a) Vessels carrying loose grain in bulk shall have suitable means of securing hatchways and other weather deck openings. Hatch covers and their supports shall be in good condition and properly battened down using good and sufficient tarpaulins, cleats and wedges where necessary.

§ 144.10–90 Equivalents.

(a) Where the regulations in this part require a particular fitting, appliance or apparatus or type thereof, shall be fitted or carried in a ship, or that any particular provisions shall be made, the District Commander of the United States Coast Guard or his authorized representative may allow any other fitting, appliances or apparatus, or type thereof, to be fitted or carried, or any other provision to be made, if it is satisfactorily shown that such other fitting, appliance or apparatus, or type thereof, or provision is at least as effective as that required by the regulations in this part.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of specified loading and stowage requirements in this part are unreasonable or impracticable, the Commandant may permit the use of equivalent loading and stowage requirements in lieu of those described in this part to such extent and upon such conditions as will insure to his satisfaction a degree of safety consistent with the minimum standards set forth in Subparts 144.10 to 144.30, inclusive.

§ 144.10–95 Responsibility of owner or master.

(a) The loading of bulk grain in accordance with the regulations in this part is a responsibility of the master, who shall designate a competent responsible person to be in constant attendance during loading operations. Nothing in the regulations in this part shall be deemed to relieve the owner or master of a ship from taking all necessary and reasonable precautions to prevent grain from shifting.

Subpart 144.20—Detailed Loading and Stowage Requirements

§ 144.20–1 Trimming and filling.

(a) The safe loading of grain, in accordance with the regulations in this part, is vitally dependent upon compartments which are treated as entirely filled, being actually well trimmed so as to fill all the spaces between the beams and in the wings and ends. It is equally important that the feeders be loaded and trimmed so as to contain at least the minimum percentage of grain required by the regulations in this part.

(b) Spaces which are to be partly filled and bagged off, or equivalent, must be levelled for proper bagging.

§ 144.20–2 Bagged grain.

(a) Bagged grain stowed in a hold, compartment or bin with loose grain in bulk shall be in sound bags, well filled and securely closed.

§ 144.20–10 Stowage of full holds and compartments.

(a) Subject to the provisions of § 144.20–22, any hold or compartment which is entirely filled with bulk grain shall be divided either by a longitudinal bulkhead or by a shifting board in line with, or not more than 5 percent of the molded breadth of the vessel from the center line; or by longitudinal bulkheads or shifting boards off the centerline of the vessel, port and starboard, provided the distance between them shall not exceed 60 percent of the molded breadth of the vessel, and that in this latter case trimming hatches of suitable size shall be provided in the wings at longitudinal intervals of not more than 25 feet with end trimming hatches placed not more than 12 feet from transverse bulkheads. In every case the longitudinal bulkheads or shifting boards shall be properly constructed and fitted grain-tight with proper fillings between the beams. In holds such longitudinal bulkheads or shifting boards shall extend downwards from the underside of the deck to a distance of at least one-third of the depth of the hold or 8 feet, whichever is the greater. In compartments in tween decks and superstructures they shall extend from deck to deck. Except as provided otherwise in this section, longitudinal bulkheads or shifting boards shall extend to the top of the feeders of the hold or compartment in which they are situated.

(b) In the case of vessels loaded with bulk grain other than linseed, in which a metacentric height (after correction for the free surface effects of liquids in tanks and as otherwise noted in this part) is maintained throughout the voyage of not less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels, longitudinal bulkheads or shifting boards need not be fitted in the following locations and subject to the following conditions:

(1) Below and within 7 feet of a feeder, but only in way of a hatchway, if that feeder contains, or all the feeders collectively feeding a compartment contain, not less than 5 percent of the quantity of grain carried in that compartment.

(2) In feeders which meet the requirements of subparagraph (1) of this paragraph and which have such dimensions that the free grain surface will remain within the feeders throughout the voyage, after allowing for a settling of grain amounting to 2 percent of the volume of the compartment fed and a shift of the free grain surface to an angle of 12 degrees to the horizontal. In calculating the net minimum metacentric height, the heeling moment due to such a grain shift shall be allowed for by taking a deduction equal to this moment divided by the product of the displacement and the sine of 5 degrees.

(3) In way of the hatchway where the bulk grain beneath the hatchway is trimmed in the form of a saucer hard up to the deckhead beyond the hatchway and is topped off with bagged grain or other suitable bagged cargo extending to a height in the center of the saucer of not less than 6 feet above the top of the bulk grain (measured below the deck line). In this case, the bagged grain or other suitable bagged cargo shall fill the hatchway and the saucer below and shall be stowed tightly against the deckhead, the longitudinal bulkheads, the hatchway beams and the hatchway side and end coamings. For the purposes of this subparagraph suitable packaged general cargo having a stowage factor of not less than 25 cubic feet or not more than 70 cubic feet per ton, and of such unit dimension that it can be stowed tightly to completely fill the saucer, may be used in place of bagged cargo provided a tarpaulin or separation cloth is used between the cargo and the grain.

§ 144.20–20 Feeders required.

(a) Except as otherwise provided in § 144.20–10(b)(3) and as subsequently otherwise provided in this section, any hold or compartment which is entirely filled with bulk grain shall be fed by suitably placed and properly constructed feeders so as to secure a free flow of grain from the feeder to all parts of that hold or compartment. Each feeder shall contain not less than 2½ percent nor more than 8 percent of the quantity of grain carried in that part of the hold or compartment that it feeds, except as provided in § 144.20–10(b)(1). Feeders which do not extend to the weather deck but which instead open up into a tween deck shall either be of such dimensions and filling level that a shift of grain free surface to an angle of 12 degrees to the horizontal cannot spill out of the feeder, or the grain free surface shall be secured against such shifting and spillage.

(b) When bulk grain is carried in deep tanks primarily constructed for the carriage of liquids, or in other spaces of comparable size, location, arrangement, and construction, of breadth not exceeding half the vessel's beam, or that are divided by one or more permanent steel longitudinal divisions fitted grain-tight, feeders to these spaces may be omitted if the tanks and tank hatchways are completely filled and the hatch covers secured.

§ 144.20–22 Stowage of partly filled holds and compartments.

(a) Subject to the provisions of § 144.20–24, if any hold or compartment is

partly filled with bulk grain, it shall comply with both of the following conditions:

(1) It shall be divided by a longitudinal bulkhead or shifting boards, in line with, or not more than 5 percent of the molded breadth of the vessel from the center line or by longitudinal bulkheads or shifting boards off the center line of the vessel port and starboard, provided that the distance between them shall not exceed 60 percent of the molded breadth of the vessel. In every case the longitudinal bulkheads or shifting boards shall be properly constructed and shall extend from the bottom of the deck, as the case may be, to a height of not less than 2 feet above the surface of the bulk grain. In the case of vessels loaded with bulk grain other than linseed, in which a metacentric height (after correction for the free surface effects of liquids in tank) is maintained throughout the voyage of not less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels, longitudinal bulkheads or shifting boards may be omitted in way of the hatchway.

(2) The bulk grain shall be levelled and topped off with bagged grain or other suitable cargo tightly stowed and extending to a height of not less than 4 feet above the top of the bulk grain within spaces or portions of spaces divided by such longitudinal bulkheads or shifting boards, and not less than 5 feet within portions of spaces not so divided. The bagged grain or other suitable cargo shall be supported on suitable platforms laid over the whole surface of the bulk grain. Such platforms shall consist of bearers spaced not more than 4 feet apart and 1 inch boards laid thereon spaced not more than 4 inches apart, or of strong separation cloths with adequate overlapping.

(b) Unless stability data indicates that the metacentric height maintained throughout the voyage (after correction for the free surface effects of liquids in tanks) is at least 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels, not more than two holds or compartments shall be partly filled with bulk grain; except that other holds or compartments may be partly filled with bulk grain if they are filled up to the deckhead with bagged or other suitable cargo. For the purpose of this paragraph the following conditions apply:

(1) Superimposed tween decks shall be regarded as separate compartments and separate from any lower hold below them.

(2) Feeders and partly filled spaces, referred to in § 144.20–30(a)(2) shall not be regarded as compartments.

(3) Holds or compartments provided with one or more grain-tight longitudinal divisions shall be regarded as one hold or compartment.

§ 144.20–24 Exceptions to the requirements for longitudinal bulkheads.

(a) The fitting of longitudinal bulkheads or shifting boards in accordance with the provisions of § 144.20–10 and 144.20–22 is not required under the following conditions:

(1) In a lower hold (which term also includes the lower part of the hold of a single deck vessel) if the bulk grain therein does not exceed one-third of the capacity of the hold, or where such lower hold is divided by a shaft tunnel, one-half the capacity of that lower hold; or,

(2) In any space in a tween deck or superstructure provided that the wings are tightly stowed with bagged grain or other suitable cargo to a breadth on each side of not less than 20 percent of the breadth of the vessel in way thereof; or,

(3) In those parts of spaces where the maximum breadth of the deckhead within the said spaces does not exceed one-half of the molded breadth of the vessel.

§ 144.20–26 Trimming and bagging of end spaces.

(a) When the distance, measured in a fore and aft line, from any part of a hold or compartment to the nearest feeder exceeds 25 feet, the bulk grain in the end spaces beyond 25 feet from the nearest feeder shall be levelled off at a depth of at least 6 feet below the deck, and the end spaces filled with bagged grain built up on a suitable platform constructed as required in § 144.20–22(a)(2).

§ 144.20–28 Common loading.

(a) For the purpose of §§ 144.20–10 and 144.20–20 lower holds and tween deck spaces over them may be loaded as one compartment under the following conditions:

(1) The hatches to spaces so treated as common spaces shall be of such proportions and shall have sufficient volume within their coamings and above deck so as to serve as feeders, based upon the total volume of the common spaces served.

(2) Longitudinal bulkheads or shifting boards shall be fitted deck to deck, and in all cases for the full length of the space, in the tween deck of a vessel having two decks; in all other cases the longitudinal bulkheads or shifting boards shall be fitted for the upper third of the total depth of the common spaces.

(3) In order to secure an adequate flow of grain all spaces shall comply with the requirements of § 144.20–26. Additionally, openings shall be provided in the wings of the deck immediately below the uppermost deck forward and aft of the ends of the hatchways so as to provide in combination with the hatchways a maximum fore and aft feeding distance of 8 feet. Such openings shall be located approximately on the diagonal line between the hatch corners and the corners of the tween deck spaces.

(4) The metacentric height maintained throughout the voyage (after correction for the free surface effects of liquids in tanks) shall not be less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels.

§ 144.20–30 Bulk grain in tween decks and superstructures.

(a) Bulk grain shall not be carried above deck, in the tween deck of a two-deck vessel, or in the upper tween deck of a vessel having more than two decks except under the following conditions:

(1) The bulk grain or other cargo shall be stowed so as to ensure maximum stability. The metacentric height maintained throughout the voyage (after correction for the free surface effects of liquids in tanks) shall not be less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels. Where specific data on metacentric height is not available, grain loaded above deck, in the tween deck of a two deck vessel, or in the uppermost tween deck of a vessel having more than two decks, shall not exceed 28 percent by weight of the total cargo below the space concerned; except that this limitation shall not apply when the grain carried above deck or in the uppermost tween deck is oats, barley, or cotton seed. The conditions in this subparagraph are in all cases subject to the additional condition that the master is satisfied that the ship will have adequate stability throughout the voyage.

(2) The deck area of any portion of the spaces referred to in this section which contains bulk grain and which is only partly filled shall not exceed 1,000 square feet.

(3) All spaces referred to in this section in which bulk grain is stowed shall be subdivided by transverse bulkheads at intervals of not more than 100 feet. When this distance is exceeded the excess space shall be entirely filled with bagged grain or other suitable cargo.

§ 144.20–32 Stowage of specially suitable ships.

(a) Ships which are generally of self-trimming type, specially designed and constructed for the carriage of bulk cargoes and having two or more vertical or sloping grain-tight longitudinal divisions suitably disposed to limit the effect of any transverse shift of grain, may carry bulk grain without regard to the requirements of §§ 144.20–10 through 144.20–30 subject however to compliance with the following requirements:

(1) As many holds and compartments as possible shall be full and trimmed full.

(2) For any specified arrangement of stowage the metacentric height at any stage of the voyage (after correction for the free surface effects of liquids in tanks) shall be sufficient so that the list resulting from the heeling moment due to the following assumed shift of grain shall not exceed 5 degrees or the angle at which one-half the freeboard is immersed, if less.

(3) In all holds and compartments, grain surfaces are assumed to settle 2 percent by volume and at a slope of 30 degrees under all surfaces which have an inclination of less than 30 degrees to the horizontal. All resulting grain free surfaces except those sloping opposite to the direction of list (i.e., sloping towards the high side after list) are assumed to shift to an angle of 12 degrees with the original horizontal.

(4) However, any grain surfaces which are overstowed in accordance with § 144.20–22 shall be assumed to shift after settling, to an angle of 8 degrees with the original horizontal.

(5) Where the metacentric height necessary to compliance with the provisions of this section is considered to be excessive, the design of vessel will be required to be suitably modified or stowage in accordance with §§ 144.20–10 through 144.20–30 will be required.

(6) Where acceptance under the provisions of this section is desired, calculations relative to the anticipated loading and to the foregoing stability requirements shall be submitted to the Commandant, U.S. Coast Guard, for approval prior to commencement of construction. These will be subject to confirmation by a stability test as provided in § 93.05–1 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(b) Where considered necessary, supplementary conditions shall be required either with respect to the vessel's design and construction, or with respect to particular loading precautions to prevent shifting of grain.

§ 144.20–34 Stability conditions.

(a) It is a condition of acceptance of loading based upon the stability limits specified in this subpart that the vessel shall be supplied with plans and stability data, approved by the Commandant, including the following information:

(1) A capacity plan, including grain capacities and centers.

(2) The minimum acceptable GM when carrying grain.

(3) Stability data applicable to typical loading conditions for grain and other homogeneous cargoes when loaded at stowage factors of 45, 55, 65, 75 cubic feet per ton. Such data shall be given, in each case, both for typical departure and arrival conditions. Where an arrival condition includes salt water ballast, and an intermediate tankage condition results in a lesser GM, such intermediate condition shall also be given. In calculating the available GM, free surface allowance shall be made for all slack liquids, but in no case shall the free surface correction used be less than that corresponding to maximum free surface for the pair of tanks, port and starboard, of each type, having the largest free surface, plus the fuel oil settlers, plus the virtual free surface at 5 degrees heel for all nominally full fuel oil tanks (taken 98 percent full).

(4) To provide for conditions wherein shifting boards may be omitted, as provided by § 144.20–10(b)(2), grain free surface applicable to feeders not fitted with shifting boards shall be given. In order to provide flexibility in the subsequent selection of feeder arrangements, this free surface shall be presented as a function of the aggregate length of feeders, grain density, and vessel displacement rather than as just applying to any specific grain stowage arrangement.

(b) The stability information supplied specially suitable ships shall, in general, comply with this section subject to such modification as is necessary, having regard for their special arrangements.

(c) Double bottom tanks having a width measured at half length in excess of 60 percent of the vessel's molded breadth shall in no case be permitted. Such tanks shall therefore be divided by a watertight longitudinal division.

§ 144.20–36 Grain loading plans.

(a) Vessels carrying grain shall be loaded in accordance with grain loading plans bearing the approval of the National Cargo Bureau, Inc., or of another agency otherwise officially designated. A grain loading plan shall take into account the applicable requirements of this subchapter and shall indicate the main characteristics of the fittings used to prevent the shifting of cargo. It shall indicate the distribution and the circumstances of loading. Additionally, in all cases where approval is dependent upon the stability limits specified in this subpart, it shall, in conjunction with the information called for by § 144.20–34, indicate the applicable minimum GM and associated tankage conditions.

(b) A grain loading plan, in addition to the language in which it is given, shall be annotated in at least one other of the following languages: English, French, Spanish, or Russian.

(c) A copy of the grain loading plan shall be maintained at all times on the vessel. The master, if so required, shall produce it for the inspection of the appropriate authority of the port in which loading takes place.

(d) A grain loading plan and associated stability information approved for a vessel belonging to a country which is a party to the effective International Safety of Life at Sea Convention, issued either under the authority of the government of that country or under the authority of another government which is a party to that Convention upon the request of the first government, will be accepted by the United States. Other contracting governments have agreed to accept such information as evidence that the vessel, when loaded in accordance with this grain loading plan, meets the applicable grain loading requirements of the effective Convention.

(e) Vessels not having a grain loading plan approved in accordance with the paragraph (d) of this section may expect to be required to comply in detail with the rules of the country in which the loading port is situated.

Subpart 144.30—Vessels Shifting Ports

§ 144.30–1 Shifting vessels with part cargoes of loose grain in bulk.

(a) The regulations in this subpart shall apply to vessels loaded with part cargoes of loose grain in bulk shifting between ports for the purpose of loading additional cargo and modify certain requirements under Subpart 144.20. Masters of all vessels shifting ports under these modified requirements shall check with the Weather Bureau to ascertain the forecast of the weather to be encountered on the voyage and shall not proceed under these conditions when unusually adverse weather conditions are indicated.

(b) Vessels subject to the regulations in this part, moving between ports totally within the inland waters of the United States, may load any amount of loose grain in bulk without securing the grain provided shifting boards extend above the grain in each hold at least 2 feet. Vessels that have no longitudinal bulkheads or shifting boards in the lower holds shall comply with § 144.20–24 (a)(1).

(c) Vessels shifting between United States ports along the east coast as far south as Cape Henry, between Gulf ports, between Puget Sound ports and West Coast Canadian ports, between Puget Sound ports and Columbia River ports, between San Francisco, Los Angeles Harbor and San Diego, or between Great Lakes ports and St. Lawrence River ports as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island, and on the north side of Anticosti Island following the 63d meridian may load the following amounts without securing the grain provided the grain is covered with dunnage boards placed fore and aft and athwartship:

(1) Any hold with less than 50 percent of its bulk grain capacity provided shifting boards extend above the grain in each hold at least 2 feet.

(2) One hold with more than 50 percent of its bulk grain capacity and one other hold with less than 50 percent of its bulk grain capacity provided shifting boards extend above the grain in each hold at least 2 feet.

(3) Where no longitudinal bulkheads or shifting boards are required to be erected, only two slack holds not exceeding the capacities specified in § 144.20–24 (a)(1).

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